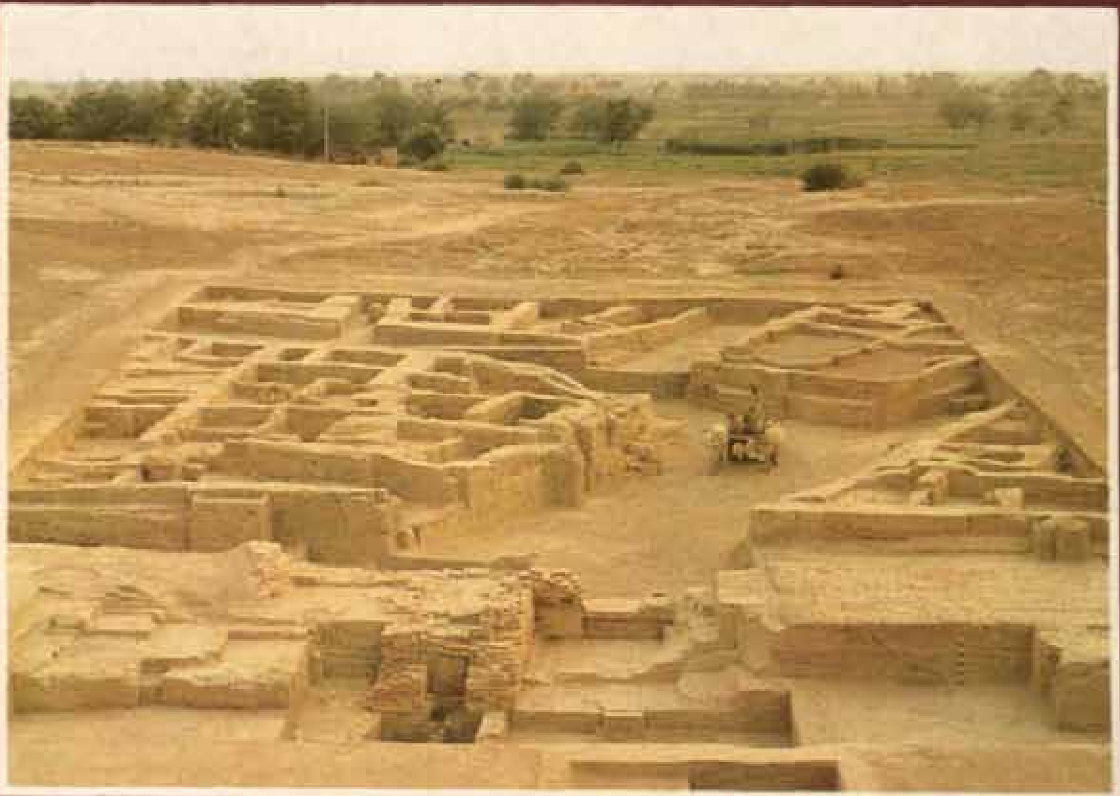
Indian Archaeology

1986-87 — A REVIEW









INDIAN ARCHAEOLOGY 1986-87
—A REVIEW

EDITHD BY
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Director General
Archaeological Survey of India



ARCHAEOLOGICAL SURVEY OF INDIA
GOVERNMENT OF INDIA
NEW DELHI
1992

Cover : Banawali excavations. District Hissar, Haryana

Top row from left : terracotta addorsed bull : terracotta scaling ; and applique bucranium motif on a vase, all of Harappan period.
Bottom : west gale complex with major streets and residential blocks of lower town, Harappan *period.*

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CONTENTS

PREFACE

The present issue *of Indian Archaeology—A Review* is being brought out after some delay due to factors beyond our control. Apart from the material on different aspects of archaeology in the country, it also includes information on investigations of the pre-Islamic remains in the Maldives and conservation of Angkor Vat temple in Cambodia undertaken by two separate teams of the Archaeological Survey of India.

I am sure, the readers will find in these pages useful material which has been contributed by various Branches and Circles of the Survey, State Departments, Universities and other agencies. While the contributors are responsible for the accuracy of the information supplied, I take the responsibility for the omissions, if any, and other shortcomings. I am thankful to all the contributors besides my colleagues whose efforts have helped in bringing out the present issue. I express my grateful thanks to all of them particularly Sarvashri K.V. Ramesh, K.N. Dikshit, B.M. Pande, C. Dorje, J.C. Gupta, K.P. Padhy, A. Jha, Smt. S. Pramanik and Kumari Arundhati Banerji.

New Delhi
16 October 1992

M.C. JOSHI

INDIAN ARCHAEOLOGY 1986-87
— A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDAMAN AND NICOBAR ISLANDS

1. EXCAVATION AT MITHAKHARI V, SOUTH ANDAMAN.—In continuation of last year's *(Indian Archaeology 1985-86 — A Review,* p.1)[1] work in the Andaman Islands, the Prehistory Branch of the Archaeological Survey of India[2] under the guidance of B.P. Bopardikar, assisted by S.B. Ota, N.G. Nikosey, A.J. Nambiraju, R.K. Dwivedi, N.K. Nimje, P.S. Pashine and T.B. Thapa undertook a trial dig at a locality named Mithakhari V (which was referred to as Hathi Top earlier) in the &administrative village boundary of Mithakhari. The main objective of the digging was to ascertain the undisturbed cultural horizon for some earlier occupation, if any, at the locality apart from the known cultural phase of shell-midden sites in South Andaman and to understand the relationship between sites through comparison between sites within one microecozone (i.e. Mithakhari valley), in terms of the cultural material.

The site is located in the Mithakhari valley floor which is below the contour height of 20 m. The valley is surrounded on all sides by deforested ridges except on the south-east direction where the valley opens up to the mangrove swampy coast which is about 1 km from the present locality. This valley is a rich source for the availability of marine shells. The valley floor is drained by a fresh water stream called Mithakhari *nullah,* which is the only source of natural fresh water in the area. Probably, this is the determinant factor for the occurrence of cluster of shell midden sites (i.e. Mithakhari I-VII) as observed in the valley. This valley floor is now under paddy cultivation.

Mithakhari V stands isolated overlying the rocky outcrop seen exposed on the side of the mound. The accumulation of cultural debris looks like a conical heap. The mound is circular in shape, measures about 23 m in diameter with a height of 4-5 m. A trial trench measuring 1 sq. m was laid at the highest point on the top of the mound. Digging continued up to the beach sand through cultural debris which is composed mostly of a variety of marine shells. The beach sand which is culturally sterile rests on the outcrop. A total cultural deposit of 2-1 m was encountered in the trial trench, in which various levels of shell dumps have been observed. The most interesting feature noted in the excavation was the sterile horizon occurring approximately 65 cm below surface. The sediments from this sterile horizon as well as subsequent stratum show that the site was deserted for some time and subsequently it was again reoccupied.

A variety of marine shells comprise the major composition of the cultural debris. Preliminary observation shows that the variety and frequency of shells vary from one horizon to another. This

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[1]This publication is referred to in the following pages by the year only.

[2]Thc Archaeological Survey of India is referred lo in the following pages as the 'Survey'.

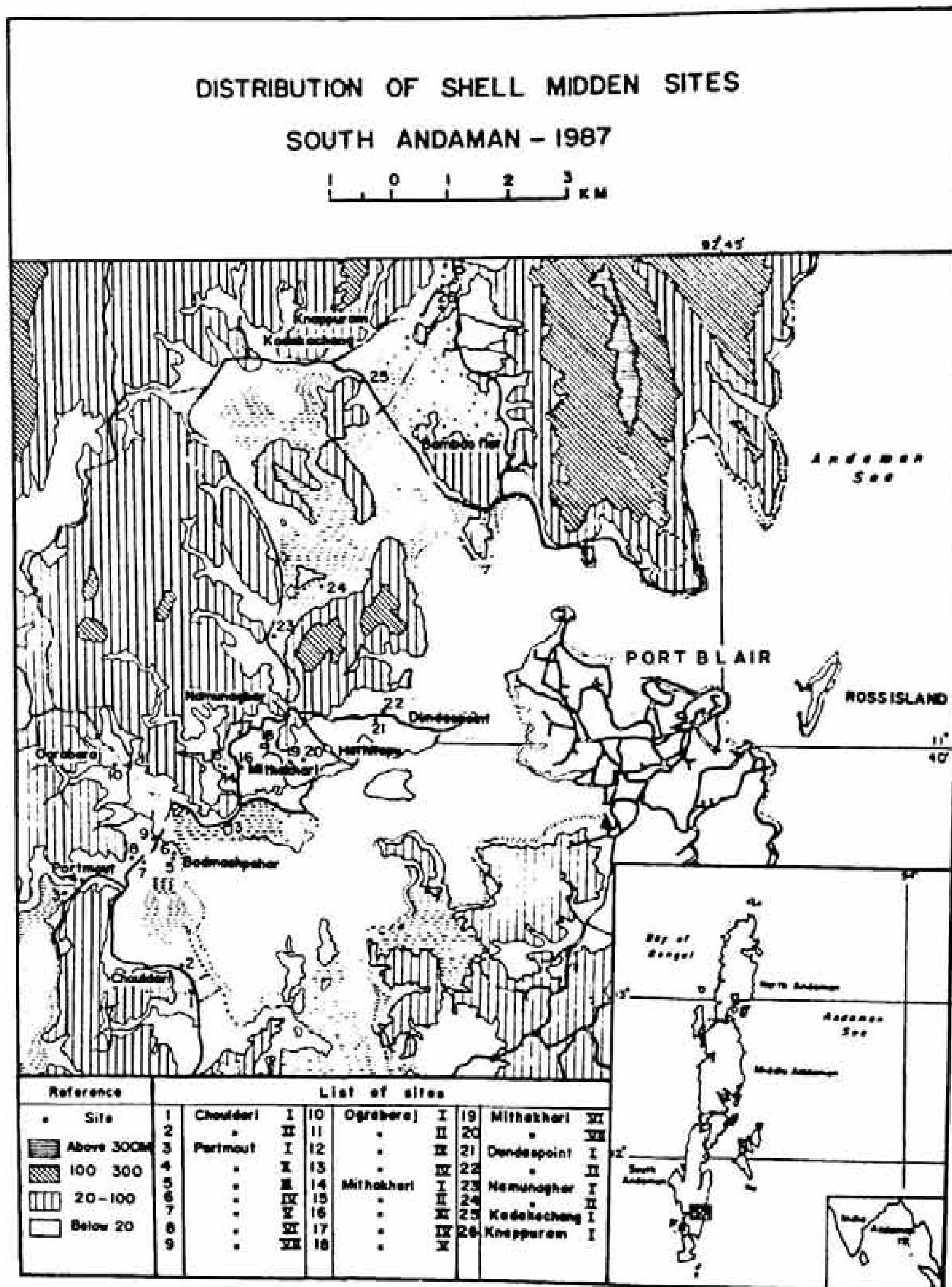

DISTRIBUTION OF SHELL MIDDEN SITES
SOUTH ANDAMAN - 1987
1 0 1 2 3 KM
PORT BLAIR
ROSS ISLAND
Andaman Sea
Bay of Bengal
Chouldari
Portmout
Badmashpahar
Ograbaraj
Mithakhari
Namunaghar
Dandaspoint
Bamboo flat
Kadakachang
Knappuram
Reference
Site
Above 300M
100 300
20-100
Below 20
List of sites
1 Chouldari I
2 " II
3 Portmout I
4 " II
5 " III
6 " IV
7 " V
8 " VI
9 " VII
10 Ograbaraj I
11 " II
12 " III
13 " IV
14 Mithakhari I
15 " II
16 " III
17 " IV
18 " V
19 Mithakhari VI
20 " VII
21 Dandaspoint I
22 " II
23 Namunaghar I
24 " II
25 Kadakachang I
26 Knappuram I

FIG. 1

difference in the occurrence of shells is important for understanding the seasonal subsistence behaviour of man during the past as an adaptive mechanism to the coastal environment. Charred shells occur at various levels, but in less frequency. Apart from shells, crab claws and fish bones have been recovered almost from all levels. Fragmentary bones which are probably of *Sus sp.* are extremely few.

Fragments of potsherds mostly handmade red ware were collected from all the horizons. Only four major artefacts were recovered from the excavation, which include a shell point (0.5 cm below surface), two hammer stones (at a depth of 80-85 cm and 180-185 cm respectively) and a large shell point (at a depth of 145-150 cm).

Not much can be said about the various sub-phases on the basis of the cultural material obtained from the trial dig ; however this shell midden cultural phase at the site could be considered to be the earliest occupation in the area.

2. EXPLORATION IN SOUTH ANDAMAN.—In continuation of last year's *(1985-86,* p. 1) work in the Andaman Islands, the Prehistory Branch of the Survey, under the guidance of B.P. Bopardikar, assisted by S.B. Ota, N.G. Nikosey, A.J. Nambhiraju, R.K. Dwivedi, N.K. Nimje, P.S. Pashine and T.B. Thapa, undertook intensive exploration of shell midden sites in South Andaman. The main objective of the investigation was broadly twofold; firstly, to locate and systematically document shell midden sites and secondly, to identify potential sites for large-scale excavation for reconstructing the subsistence-settlement pattern of culture as an adaptive mechanism to coastal environment. Exploration was confined to the villages Chouldari, Dundaspoint, Kadakachang, Knappuram, Mithakhari, Namunaghar, Ograbaraj and Portmout, which led to the discovery' of altogether 26 sites including some earlier reported sites (fig. 1). All these sites belong to one cultural phase, which were studied in the context of both physical environment and biomass. Shell midden sites documented during the course of investigation are as under :

Village	*Site*
Chouldari	Chouldari I
-do-	Chouldari II
Dundaspoint	Dundaspoint I
-do-	Dundaspoint II
Kadakachang	Kadakachang I
Knappuram	Knappuram I
Mithakhari	Mithakhari I
-do-	Mithakhari II
-do-	Mithakhari III
-do-	Mithakhari IV
-do-	Mithakhari V
-do-	Mithakhari VI
-do-	Mithakhari VII

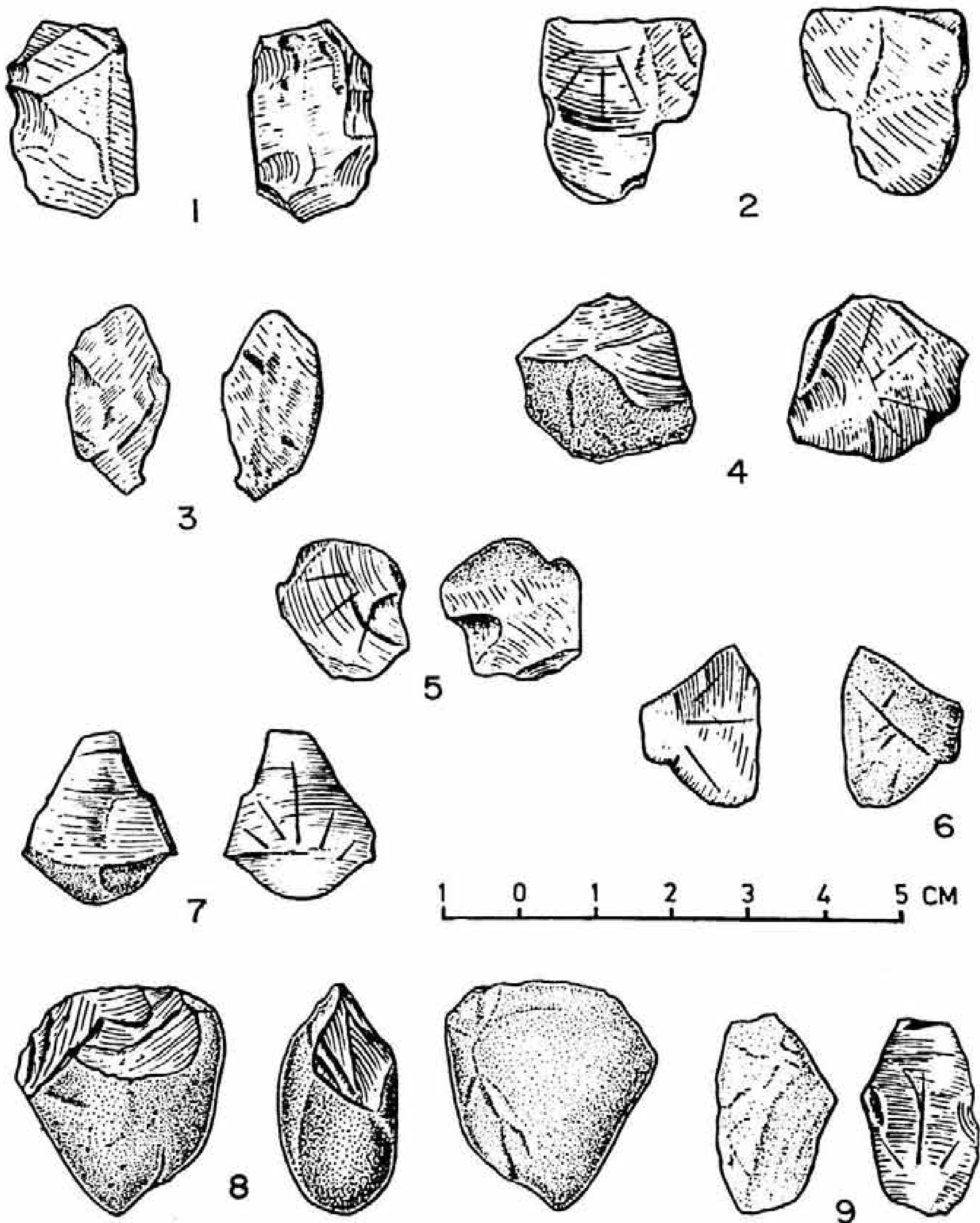


FIG. 2. *Knappuram I : Quartzite tools*

Village	*Site*
Namunaghar	Namunaghar I
-do-	Namunaghar II
Ograbaraj	Ograbaraj I
-do-	Ograbaraj II
-do-	Ograbaraj HI
-do-	Ograbaraj IV
Portmout	Portmout I
-do-	Portmout II
-do-	Portmout HI
-do-	Portmout IV
-do-	Portmout V
-do-	Portmout VI
-do-	Portmout

All these sites have been documented locality wise on the basis of their location in the present day village administrative boundary.

These sites vary in size, shape, location and context of occurrence. The mean height of these mounds is about 3-25 m and the area measure on an average about 293 sq. m. On the basis of location, shape and context of occurrence, the sites may be classified into several categories. The shell-middens are associated with three different contexts, such as sediments of mangrove swamps, rocky outcrops and alluvium. They occur mainly in two different situations, i.e. completely isolated mounds and on the crest of hillock or raised land. So far the scattering pattern of debris is concerned the shell-middens vary from circular to somewhat oval-shaped. These shell middens are found to be occurring both in the form of a heap as well as shallow scattered flat sheet of debris. Based on this difference in the form of the kitchen middens the future investigations may have to be oriented so as to understand this difference as well as the settlement pattern.

All these shell midden sites are located below the 20 m contour. Majority of them occur mainly in the valleys in the form of clusters surrounding the perennial natural freshwater sources (in the form of springs or streams) as is the case of the localities in the Mithakhari and Portmout valleys. These water bodies may therefore be considered as one of the major factors influencing the site pattern.

Interestingly enough, a clear cut occupational break as represented by the sterile layer noticed at Chouldari I, Mithakhari V and VII was observed. At present, it is difficult to assign any reason for this large-scale desertion in occupation.

Incidentally, it may be mentioned that the shell midden sites are fast disappearing due to modern habitation on some of the mounds, quarrying of shells for extraction of lime, and other processes operating such as pedoturbation and bioturbation leading to the destruction of the sites.

All the occupational deposits constitute varieties of marine molluscan shells comprising different species of both *Gastropede* and *Bivalvia,* which occur in large density in all horizons of the occupational debris. Apart from this, majority of the sites have yielded a large amount of animal bones,

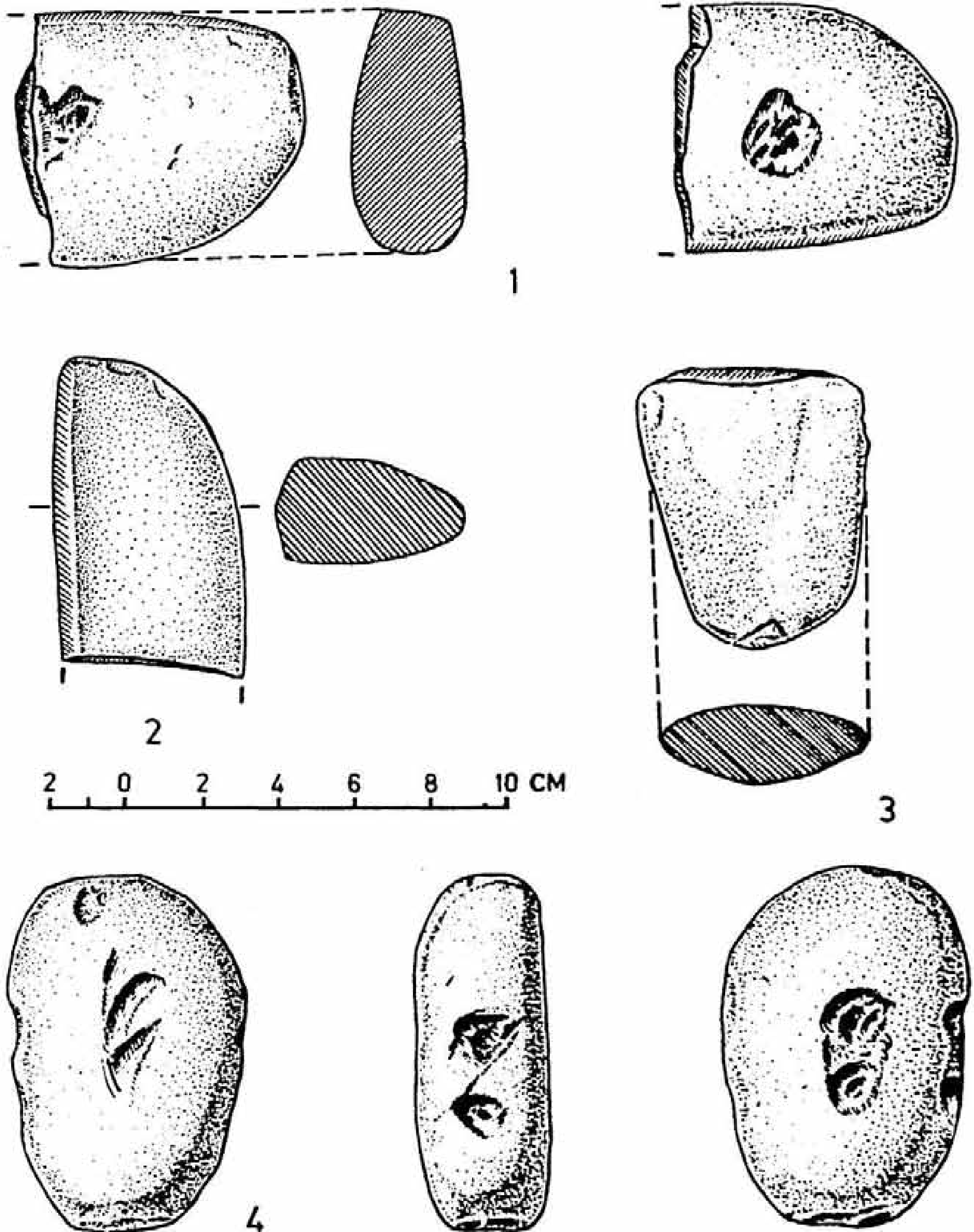


FIG. 3. *Stone Objects : 1 and 2 from Knappuram I; 3 from Chouldari I; and 4 from Chouldari II*

particularly those of *Sus scrofa.* Fish bones and crab claws which are of marine origin are also represented in the midden. Evidence of charred shells and bones, and occurrence of cut marks observed on some of the animal bones is interesting. These evidences indicate direct human activity on these faunal remains, which support the assumption that the subsistence economy of the community was partly based on gathering of shells, crabs, etc. and hunting of wild game like the pig.

The exploration also revealed some excellent cultural remains which include shell and bone tools (pl. I), stone artefacts and pottery. Shell tools comprise spatulas, scrapers and points whereas bone tools comprise of points only. Stone artefacts consist of flakes, chips and small unifacial chopper of milky quartz, hammer stones, anvils and pestle (figs. 2 and 3). The raw materials for fabricating stone tools are on sea worn pebbles and cobbles, exploited exclusively from the coast. It has been observed that the milky quartz artefacts are mainly confined to the top surface of the mound, probably belonging to a very late phase. Some of the sites have also yielded perforated shells. So far the stone, bone and shell tools as well as faunal remains are concerned, Knappuram is one of the richest sites. Apart from these, pottery constitutes major cultural material as represented at the majority of sites. The pottery is all in red ware and is handmade. Almost all of it is of thick fabric, gritty and ill-fired and mostly contains incised designs such as parallel lines, criss-cross etc., on both exterior as well as interior surfaces. The shapes comprise of jars, basins, etc. From the surface of the sites (such as Portmout VI and Mithakhari Vetc), iron and copper objects have been obtained, which seem to belong to a later phase of occupation.

ANDHRA PRADESH

3. EXPLORATION IN DISTRICT CUDDAPAH.—P.C Venkata Subbaiah, a Research Scholar of the Deccan College, Post-graduate and Research Institute, Pune, undertook village-to-village survey and brought to light twenty-nine sites of archaeological interest:

Taluk	*Village/Site*	*Nature of remains*
Jammalamadugu	A. Kambaladinne	Neolithic
-do-	Beditippenapadu	-do-
-do-	Chinnamudiyam	-do-
-do-	Dannawada	-do-
-do-	Gudemcheruvu	-do-
-do-	Jangalapallii	-do-
-do-	Madhavapuram	-do-
-do-	Mylavaram	-do-
-do-	Paddamudiyam	-do-
-do-	Paluru	-do-
-do-	Vaddirala	-do-
-do-	Veparala	-do-
Kamalapuram	Akkampeta	-do-

Taluk	*Village/Site*	*Nature of remains*
Kamalpuram	Koduru	Neolithic
-do-	Ramireddipalli	-do-
-do-	Tippaluru	-do-
Muddanuru	Nidivelogala	-do-
Preddatur	Chapadu	-do-
-do-	Gadeguduru	-do-
-do-	Idamadaka	-do-
-do-	Tondaladine	-do-
-do-	Vellala	-do-
Pulivendla	Balijapalli	-do-
-do-	Inagaluru	-do-
-do-	Koraguntapalli	-do-
-do-	Kottagundavaripalli	-do-
-do-	Kottapalli	-do-
-do-	Paluru	-do-
-do-	Ulimella	-do-

These sites are located close to.the banks of the river Pennar, Kunderu and their tributaries and lie in the cultivated fields away from the hills. The habitation debris varies from half a hectare to one and a half hectares in extent and from one half to one and a half metres in depth. The ceramic industry comprises black-on-red painted pottery with simple linear designs and plain pottery of buff, grey, black and tan fabrics. The pecked and ground stone industry is represented by axes, adzes, hammer stones, sling balls, querns, rubberstones of dolerite, sandstone, granite, etc. The- blade industry is based on the working of chert and consists of flakes, scrapers, fluted cores, etc. These sites have also yielded a considerable quantity of animal bones belonging to cattle and other domestic animals. The collection also includes a few bone points.

The Department of Archaeology and Museums, Andhra Pradesh, also located a few prehistoric painted rock shelters in the Palakonda Reserve forest at a distance of seven kms. from Bangga Agraharam. The figures consist of animals such as antelopes, horses, bulls and human figurines, bow and arrows and other decorative devices.

4. EXCAVATIONS AT RAJAHMUNDRY (NEAR CHITRANGI PALACE), DISTRICT EAST GODAVARI.—The Department of Archaeology and Museums, Andhra Pradesh, conducted excavation at the site, where some temple pillars had been found while digging for the foundations of the Railway Rest House in the premises of the Chitrangi Palace. At this site, a big closed stone gate and five medieval sculptures had been found earlier. The excavation revealed an "L" shaped hall running in north-south direction taking a turn to east at the southern end. While the four pillars found are of black granite, the foundation blocks are of sandstone. The size of the bricks and the nature of construction indicate that the structure may belong to the fourteenth-fifteenth century AD.

5. EXPLORATION AT PEDDAKONDURU, DISTRICT GUNTUR.—I.K. Sarma of the Survey along with Parabrahma Sastry, former Deputy Director, Epigraphy, Government of Andhra Pradesh, Hyderabad, explored the village of Peddakonduru (16°27' N; 80° 42' E), 19 km north-east of Tenali, famous for medieval temples and ancient mounds extending over an area of 10 acres. The mounds had been mostly dug by local persons at several places for earth. The cut-sections to a depth of six to eight metres revealed a strata yielding black and red ware, polished black and associated slipped wares at the lowest level. Inscriptions over the temples of Rajarajesvara, Anandesvara and Janardana provide an account of their flourishing status under the patronage of the Kakatiya rulers.

The temple of Anandesvara, in particular, has revealed a unique *linga* within its square sanctum. It is made of whitish Palnad limestone and stood to a height of 60 cm above the squarish *padmabandha pitha.* On its frontal facet, over the *Vishnubhaga,* is a standing four-handed human figure, 30-5 cm high, carved in low relief. The right ear has *makara kundala* while the left shows *chakra* or *pushpa kundala.* The lower *vastra* extends right upto the knee, the *mekhala* clearly shown with the prominent *nabhi sthana.* An elongated *munda-mala* is across the right torso. The *rudra bhaga* of the *linga* has a tuft *(sikha)* on its rear. The graceful *abhanga* stance, the bent hip and the ear ornaments, the *kanthikas* and *nupuras* suggest that the left pan was intended as to be that of a youthful female. The representation is thus of an *ardhanari* over the *linga.* The temple from its geographical location and the name Anandesvara brings to mind, the kings of Kandara lineage who were known as the Anandagotrins, proteges of *Sambhu-Siva.* This *ardhanari linga* of limestone, first of its kind in this region, can be assigned to the post-Ikshvaku period i.e. fifth century AD which coincides with the rise of the royal house of Anandagotrins.

6. EXPLORATION IN DISTRICTS GUNTUR AND KRISHNA.—The Department of Archaeology and Museums, Andhra Pradesh, conducted exploration on the hill-top of Vinukonda in District Guntur and collected potsherds of coarse dull red and dull grey ware, in the shape of out-curved and out-turned rim of a globular vase, rim of pot and dish etc., resembling the pottery of the' early historical period.

On the outskirts of Etravaripalem village in Karlapalem Mandal of the same district was found early historical pottery which includes the red ware, red-slipped ware, black ware and black-and-red ware besides sculptures of Buddha, torso of Buddha, mother goddess, etc. Minor excavations at Guttikonda in Sattenapalli taluk of District Guntur also yielded handmade pottery in red, chocolate, grey, black buff and black-and-red wares, two rubber stones and a biconical bead of red jasper.

A trial pit dug at a site in Kolavennue village in District Krishna yielded black-and-red ware and vertical stone slabs or orthostats which suggest megalithic affiliation of the site.

7. EXPLORATION IN DISTRICT KARJMNAGAR.—I.K. Sarma assisted by M.U. Qureshi and K. Padmanabha explored some ancient sites containing Buddhist remains in the district.

Kampalli (18° 52' N; 79° 09' E) is situated on Karimnagar-Adilabad road and is locally known as Kambhapalli. To the south of the village, sprawling on the low hillocks, are some ancient mounds close to each other, which contain remains of a pillared hall, brick viharas and stupa. An eight-spoked wheel-shaped stupa of 8-70 m diameter, with a square hub at the centre, was found. *Ayaka* platforms at the cardinal directions were partly visible. Some stumps of *ayaka* pillars were also found *in situ.* Remains of an extensive pllared hall *(saila-mandapa)* could also be seen.

Pashgaon is a roadside village, 53 km north of Karimnagar on Lakhisetpet road. The very name of the village connotes—*Pash* standing *for parsva,* gaon for *grama,* i.e. *Parsvagrama,* literally meaning left-side village. The nearby low hill range possesses spotted brown sandstone similar to Mathura and Bharhut examples. A few rock-cut shelters with plain beds and niches were noticed. The hillock is being indiscriminately quarried by the locals for the colour of the stone. Remains of the circular *chaitya-griha* of brick by the side of an impressive apsidal shrine and vihara complex were also visible on the hilltop. The circular *chaitya* was found encased around with ornamental limestone slab each measuring l.50 X 1.10 metres (pl. IIA). These slabs possessed relief carvings as on the stupa slabs of Amaravati. The pilasters marking the terminals possess *padma padukas, kumbha* at the base and upper register, hexagonal mid-sections, etched with lotus medallions. The capital component has, interestingly enough, addorsed *ihamrigas* or winged *gaja-vyalas* back-to-back. The floor around the *pradakshina-patha* is well laid and possesses Buddhist symbols like the *svastika, srivatsa* and *nandipada* made of chips of mother-of-pearl.

8. EXCAVATIONS AT NELAKONDAPALLI, DISTRICT KHAMMAM.—The Department of Archaeology and Museums, Andhra Pradesh, resumed the excavation at the Maha Stupa and the habitation site near Birgagulagutta with a view to exposing the structural details of the Maha Stupa and for assessing the nature of the habitation site.

The Maha Stupa measures **16.5** m in height, about 33 m in radius at *pradakshina-patha* level and about 26 m at drum level. The height of the dome is 6-60 m and that of the drum is 3.90 m. The *pradakshina-patha* measures 3.5 m in width and 2-10.m in height. The staircase attached to the *ayaka* platform on the eastern side is provided with 14 steps plastered with lime.

The antiquities found include coins of the Ikshvakus and the Vishnukundins and terracotta beads and bangles. At the habitation site was exposed the foundation portion of a large structure oriented east-west, the floor of which is paved with limestone slabs over a levelled brick bottom and bound by brick wall plastered with lime. The southern side wall is connected with a drainage channel, built of bricks and is provided with a soak-pit towards the north-eastern corner. Towards the western side of the trench a portion of a rectangular structure oriented north-south with two long limestone steps was brought to light. Coins of the Ikshvaku and Vishnukundin periods, large number of bowls, pots and beads were also found.

9. EXPLORATION IN DISTRICTS KHAMMAM AND WARANGAL.—The Department of Archaeology and Museums, Andhra Pradesh, brought to notice clusters of burials on either side of the Godavari basin extending over 50 km upstream on the hill tops or on the nearby slopes. The burial assemblages include megalithic pottery, large-size iron weapons, stirrups and sarcophagi of different sizes. The burial complexes extend from Pasara-Tanduvari ranges on the right bank of the river Godavari upto the borders of Khammam on the west.

10. EXPLORATION IN DISTRICTS KURNOOL AND VISAKHAPATNAM.—In the course of exploration, the Department of Archaeology and Museums, Andhra Pradesh, noticed rock paintings in red ochre at Pudicherla and K. Bollaram in District Kurnool and five stone sculptures belonging to Virasaiva cult

near Kondayyavalasa village. The find-spot is locally called Veerulapadu. The exploration further yielded brickbats, potsherds in red ware, a broken terracotta *nandi,* stone idols and dressed stone slabs of *adhisthana* at the same site in Visakhapatnam district.

11. EXCAVATION AT ALAMPUR, DISTRICT MAHBUBNAGAR.—The Hyderabad, Circle of the Survey under the direction of H.N. Singh, assisted by D. Hanumantha Rao and S.V.P. Halkatti, conducted small-scale excavation around Nava Brahma group of temples with a view to ascertaining the cultural sequence of the site and to study the foundation details of the temples and their interrelationship on the basis of the stratigraphy of the site.

To begin with, the area around the Padma Brahma temple was selected for excavation. In all, six trenches of different dimensions were laid, two each on north, west and southern sides of the temple. The excavation at the site revealed fourfold cultural sequence.

Period I (third to fifth century AD) was represented by a massive brick wall of 1.25 m width running south-west to north-east direction. Built of well-fired bricks of two different sizes 47 X 23.5 x 8 cm and 44 X 22 X 8 cm, it was having ten courses. It was traced upto a length of 5 m and was found underlying the foundation courses of Padma Brahma temple on one side and the *mahadvara* on the other. Overlying the black cotton soil, the occupation strata of the period was represented by brown earth mixed with brickbats, terracotta tiles and early historical wares. The pottery of the period included red-slipped, red-polished, black-slipped and black-polished wares. Some of the noteworthy pottery types included jars, vases, bowls with flat and round bases and *lotas.*

Period II (sixth to ninth century AD) was marked by brick walls built of reused bricks mostly with one or two courses. The basal courses of these temples were laid right over the above mentioned massive brick wall of period I. The occupation layer of the period yielded brickbats, dull-red ware and red-ware sprinklers datable to early medieval period during which the foundation of the Padma Brahma temple was laid.

Period III (tenth to thirteenth century AD) was represented by rubble structures, walls and platforms built of dressed local raft-stone. The houses were provided with well-paved stone floors and were externally applied with lime-plaster. The associated finds included a brass ring, medieval pottery, such as grey ware, coarse red and coarse black wares.

Period IV (fourteenth to seventeenth century AD) was marked by late medieval structures built of undressed local raft-stone and floors were well paved with thin variety of local raft-stone of irregular shape. The occupation strata was often found disturbed by pits. It yielded coarse grey ware, often with incised and stamped decorations, coarse red and black wares, glass bangles and a copper coin with Arabic legend datable to fifteenth century AD.

12. EXPLORATION AT ERLADINNE, DISTRICT MAHBUBNAGAR.—In the course of exploration, the Department of Archaeology and Museums, Andhra Pradesh, located six megalithic burials and more than one hundred cairn circles and an early historical habitation site in Jurala Project area. Besides, fluted cores, chert blades and flakes were also collected from the site.

13. EXPLORATION IN DISTRICT MAHBUBNAGAR — In the course of exploration, the Department of Archaeology and Museums, Andhra Pradesh, noticed prehistoric rock paintings or bruisings on cither side of the snakehood-shaped rock shelter at Songamumpalle near Koilkonda.

14. EXPLORATION IN DISTRICT ME-DAK.—The Department of Archaeology and Museums, Andhra Pradesh, found a treasure-trove comprising of some gold ornaments such as spring-like spiral with bell-shaped ends having conical projections associated with a copper ring at Paladugu in Ragodu Mandal. A platform-like structure was found around which quartz microlithic blades, points and cores were noticed indicating the existence of microlithic factory site.

15. EXPLORATION IN DISTRICT NALGONDA.—In the course of exploration, the Department of Archaeology and Museums, Andhra Pradesh, noticed a historical site at Bandapalem hamlet of Tamarebanda village in Kodad taluk. Surface exploration at the site yielded potsherds, bangle pieces, iron lumps and bead. The pottery consisted of thick red ware, black polished ware and dull red ware, some of which contain floral patterns, criss-cross lines and medallion designs. Most of the pots were made of well-levigated clay.

A habitation site of the early medieval period was also located towards north-east of the village Tadipalli almost 3 km east of Miryalguada. The site is spread over an area of about 3 acres which has been disturbed by the local people for cultivation. Beads and various types of bangle pieces, potsherds of thick red, black polished and dull red wares, rims of bowls, jars, storage jar lids, lid-cum-bowl etc., were also collected. Pottery with incised floral and spiral designs, criss-cross patterns, nail impression, etc., and two beads, a biconical disc bead of stone and the other a button-shaped paste bead were also collected.

16. EXPLORATION IN DISTRICT PRAKASAM.—An ancient wall having historical importance was noticed at Mittapalyam near Gundluru by the Department of Archaeology and Museums, Andhra Pradesh. Potsherds of red, black and dull red wares were collected from the surface.

In the course of survey of submersible area coming under the Somasila Project three temples were noticed; of these, Chennnakesvaswamy and Vemulamma temples are datable respectively to twelfth century and thirteenth century AD, the third temple, Ramabhajana Mandiram is modern. Besides, a Siva temple was also located at Konapuram. It consists of a sanctum, *antarala* and a *mandapa* with a wooden *dhvaja-stambha.*

In the course of village-to-village survey, P. Sitarama Murthy of the Hyderabad Circle of the Survey discovered the following sites :

Taluk	*Village/Site*	*Nature of remains*
Kandukur	Baddipudi	Late medieval temple
-do-	Chinnapavani	Late medieval palace
-do-	Chundi	Early medieval temple
-do-	Gollapalle	Early historical
-do-	Linga Samudram	Late medieval temple

EXPLORATIONS AND EXCAVATIONS

Taluk	Village/Site	Nature of remains
Kandukur	Mala Konda	Cave and Brahmi inscription
-do-	Mogalicherla	Middle palaeolithic
-do-	Mutyalapadu	Medieval fort
-do-	Polinenipalam	Early historical
-do-	Rallapadu	Early historical
-do-	Veer Raghavuni Kota	Late medieval
-do-	Venkamma Peta	Early historical

17. EXPLORATION AT GOVINDARAOPET AND ELAL VILLAGES, DISTRICT RANGA REDDY.—Intensive explorations were undertaken by I.K. Sarma, assisted by G.V.S. Rao, M.U. Qureshi and N.K. Sharma around the village of Elal and Govindaraopet (Lat 17° 12' N; Long 77° 39' E) located 21 kms south-east of Tandur Railway Station. An ancient river called Kakraveni flows in west-east direction touching the northern parts of these villages. Elal has also revealed the existence of a fortification wall datable to early medieval period. It was seen that the modem habitation rests on ancient mounds. The bricks measure 40 x 20 x 7 and 36x18x7 cm. Ruins of several stone temples were found. A life-size horned *dvarapala* image bearing Rashtrakuta-Pallava characteristics was noticed besides a series of massive *lingas* and *pithas* of highly polished trap rock. In the field west of the village, a pair of feet *(pada)* of Jaina affiliation and a massive *linga* with circular *pindika* was noticed.

At the northern periphery of the village is the Varahasvami temple. It has a square *garbha-griha* facing east and marked by a stepped entrance but roofless. The side walls were made up of cut-stone blocks of late medieval times. The most important and unique feature of the temple is its *in situ* image of Bhuvaraha carved out of soft greenish limestone (pl. IIB). The image is otherwise well-preserved except the facial part and limbs of the Bhudevi. It is in bold relief, on a flat slab of one metre high and 0-70 m wide and represents a therio-anthropomorphic form of Vishnu. The head part is that of an animal *(Varahavadanah),* the rest in robust human form. The deity is four-handed with the face towards right. The tiny but graceful Bhudevi is sported up on the bent lower right hand which is holding the goddess while the upper hand extends across the rear shoulder of the Bhu. The goddess is seated at ease while the snout of the Varaha is nearing her cheek. A *sankha* is held in the upper left hand while the corresponding lower one is resting on the loop of the *vastra* below *kau.* The right foot is planted over the coil of Seshanaga (half-snake and half-man) who is shown emerging from the underworld. Such representations of Varaha are known from Eran, Udayagiri, Lucknow and Gwalior areas but these are Gupta in date depicted along with the Puranic theme amidst other deities.

The Bhudevi here, though somewhat mutilated, has a slender waist, ornamented *mekhalas* and *bahuvalayas,* triple *kanthikas,* fairly well-combed *dhammilla,* and long *kundalas,* in the ears. The uniqueness of the image lies not only in its separate iconogrphic depiction but also being under continuous worship as *mulabera* consecrated within a temple named as Varahasvami. In style it is anterior to the known Gupta examples. This rare icon has the characteristic marks of the Ikshvaku art style and appears to be the earliest example of Varaha Vishnu in south India.

Among the other stray finds from this temple area include a small image of Narasimha in limestone; The image is in round preserved upto the girdle part only, and measures 11 cm high, 15 cm

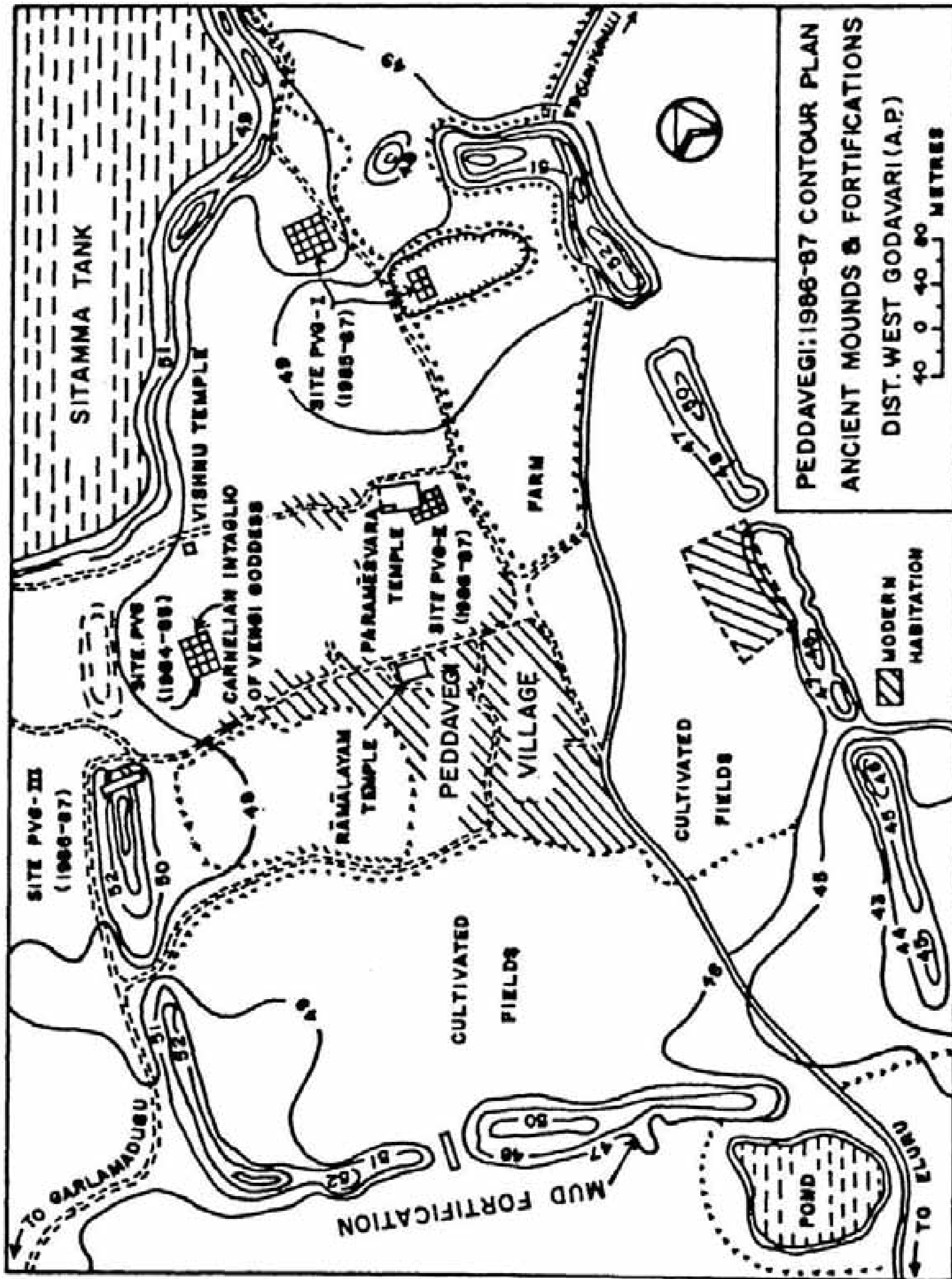


FIG. 4. *Peddavegi : Contour plan, Ancient mounds and fortification*

wide and 7.5 cm thick. Locals were using it as a pestle, the head part with the central knot *(sikha)* and hair curls afforded a good grip. The *vamavrita* curls on the head are widespread over the back and extended round the neck and frontally, taking the place of the *kanthamala.* The curls are like the peal of the custard-apple and recall the beads of the Buddha images of the Satavahana-lkshvaku period. The lion-face is broad enough like that of the wild animal. The bulbous cheeks, canine teeth, round eye-balls, narrow torus amplify the zoomorphic form. The slender waist, with *udarabandha* and ornamented *yajnopavita* across the torso, hands sturdy at the root spanning the broad chest make the image an early example of Kevala-Narasimha. It appears to be an *ishtadevata* and kept perhaps in a *koshtha.* The above two Vaishnava icons attest to the worship of Vishnu, both in *vibhava {avatara)* and *vyuha (panchavira)* aspects here.

A fragmentary slab (12.5 X 10.5 X 1 .5 cm) of brown slate aepicted *matris* seated in a row. The lower part of the Brahmi and Mahesvari are missing. The figures resemble in physique and hairdo the Siva-Parvati and Mahishamardini plaques of Peddavegi dated to *circa* fourth century AD.

Besides the above brahmanical cult objects, the village seems to be a centre of Digambara Jainism during the Kakatiya times (eleventh-twelfth century AD). The Neelkanthasvami temple in the midst of the village has revealed over its modern built *sikhara tala,* small plaques of slatestone depicting seated Adinatha on *simhasana* with a trichhatravali and flanked by *chauri*-bearers. Another plaque (11 cm square) has *yaksha-yakshi* flanking the seated Jina.

18. EXCAVATION AT BAVIKONDA IN DISTRICT VISAKIIAPATNAM.—The Department of Archaeology and Museums, Andhra Pradesh, resumed excavations at the Buddhist site at Bavikonda with a view to further exposing the structures.

The excavation revealed votive stupas raised on platforms, viharas with number of cells, *chaityagriha* II and *anda* of the Mahastupa and three halls identified as refectory, library and dining hall respectively. Besides, a tank with cisterns is located to the north-east of the Buddhist complex.

The structural wealth of the site proved that the site was not only a pilgrim centre but also a centre of learning during the early centuries of the Christian era.

19. EXCAVATION AT PEDDAVEGI, DISTRICT WEST GODAVARI.—In continuation of the previous year's work *{1985-86,* pp. 4-6), the Excavation Branch I of the Survey under the direction of I.K. Sarma, assisted by G.V. Sreenivasa Rao, S.K. Lekhawani, S.K. Mittra, Vijaya M. Lanjewar, K. Padmanabha, J.N. Gandhi, Mohinder Singh, S.V. Sutaone, P.M. Bhope, H.J. Barapatre, Indira S. Pande, M.U. Qureshi and A.U. Ganar resumed the excavations at the ancient historical city of Vengipura, now a sprawling village called Peddavegi (fig. 4). Besides the Dhanam-Dibba mound (PVG-I), the eastern and southern sides of the Paramesvara Temple (PVG-II) and Kota-Dibalu, the fortification (PVG-III) were also selected for excavation. A vertical trench was laid across the gravel fortification wall (Kota-Dibbalu) at the west of the village.

The occupation being continuous and of the historical period only overlap between the phases was imminent. However, basing on the associated structures, sculptures, coins and cult objects it has been possible to give a time bracket to excavated sequence as under.

Phase IA was assigned to the Salankayana times (mid-fourth to fifth century AD); Phase IB

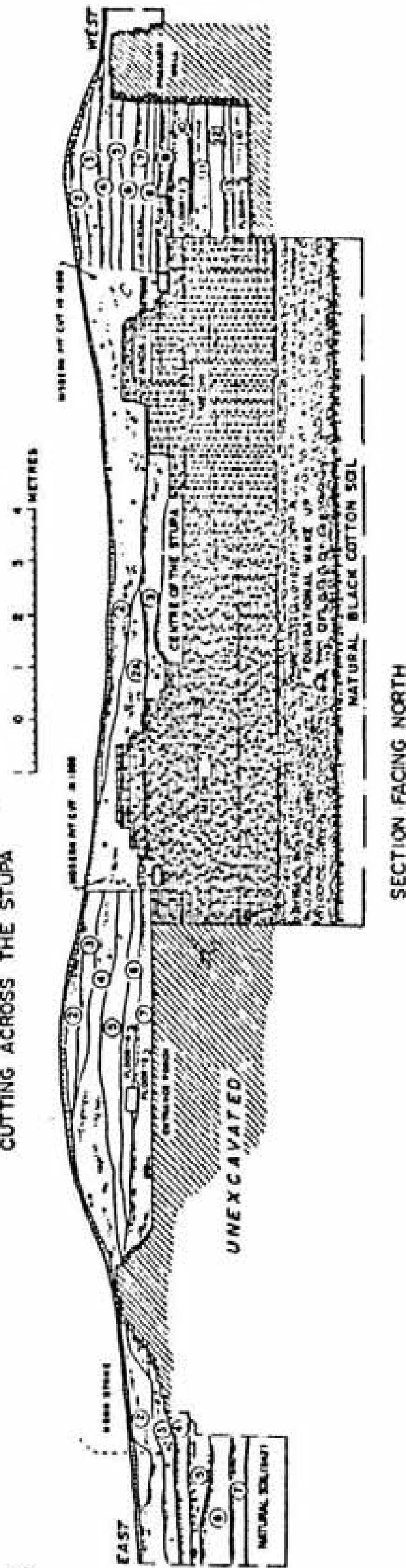


FIG 5. *Peddavegi : Cutting across the Stupa, Phase-IA, circa fourth century AD*

Vishnukundin (mid-fifth to the end of sixth century AD); and Phase ICcoincided with the establishment of the Eastern Chalukyan power at Vengi (end of sixth and the beginning of seventh century AD).

The standing temples, ruined fort walls and tanks, etc., belong to the later historical period which continued right upto the medieval times culminating with the campaign of the Delhi Sultanates (AD 1320-25).

Dhanam-Dibba (PVG-1): In order to record the foundational pattern of the stupa systematic removal of the brick courses was undertaken at the central part of the structure, right up to its base. In all, twenty-six brick courses were carefully removed (fig. 5). It was found that the earliest brickwork was laid on a 1 . 1 8 m thick raised platform comprising eight layers of river sand, rolled stones and silt duly rammed. This foundation was limited to the *medhi* (drum) part only because of the massive superstructure, whereas outside the Stupa proper, its *pradakshina* and floors in between, were freely built over a levelled ground.

Trenches were also laid to the north of the Stupa-complex. These revealed the existence of another extensive brick structure, rectangular on plan, measuring 19.40 X 17.60 m with *sopana* entrance towards east. An impressive *jagati* and *tripatta kumuda* out of cut-and-chamfered bricks were exposed to a height of 0-75 m. The *tripatta kumuda* is bound by *urdhva* and *adhah padma* decor and plastered uniformly to impart a *padmadala* look. The *adhishthana* is common throughout (pi. Ill A) and laid on bricks of 42 X 21 X 8 or 37 X 18 X 7.5 cm with fine joints. The side wall is extant to a height of 1-6 m over the *adhishthana* but this entire height was not achieved in one phase but is the result of two phases of structural activity at this complex (fig. 6). The top most. is a jerry-built brick wall above the neat basement *(padavedi)* of Phase IB. This upper phase (Phase IC), coincides with the placement of *pranala* chutes at the southern side.

The southern face of the wall *(bhitti)* part is somewhat better preserved to a height of 2-35 m. Niches were provided at regular intervals in the wall enhancing its elevational grandeur. At the southern side these *koshthas* revealed *kudyastambhikas* of circular form made out of chamfered bricks (pl. III B). These are provided with the *toranas.* Correspondingly, the niches measuring 1.40 m in width at the northern wall are heavily damaged. On the western side they are of 0-98 m width and somewhat irregularly-spaced in between, while in the corresponding eastern wall, the niches are 6-60 m wide flanking the main entrance, two on either side of the balustraded *sopana.* On the basis of the plan and elevation of the structure, the number of niches appear to have four shrines in all at the four corners, while at the centre a stepped well with a shrine was noticed. The individual shrines at the four corners, approximately of identical size, are rectangular in shape, the central one constitute a *panchayatana* on plan. The layout of the central shrine could not be fully traced as the bricks were robbed indiscriminately.

Deep digging in trench Y AI, Qdt. 3 revealed that the earliest phase of the temple-complex is coeval with the top Phase IB of the Stupa-complex. The brick *prakara* wall on the northern side of the stupa exposed last year was found veneered with dressed sandstone blocks. A brick drain provided on its outside along with this wall; thus the stupa complex was separated from the temple of the subsequent Phase IB. The wide and extensively laid brick pavement around the *panchayatana* structure was meant for circumambulation.

Among the important finds were two *pranalas,* in limestone, one in trench Ya I, Qdt. 3 and another ZAI, Qdt. 3 and 4. They were part of massive sculptured pillar 1-52 m in length and were found along

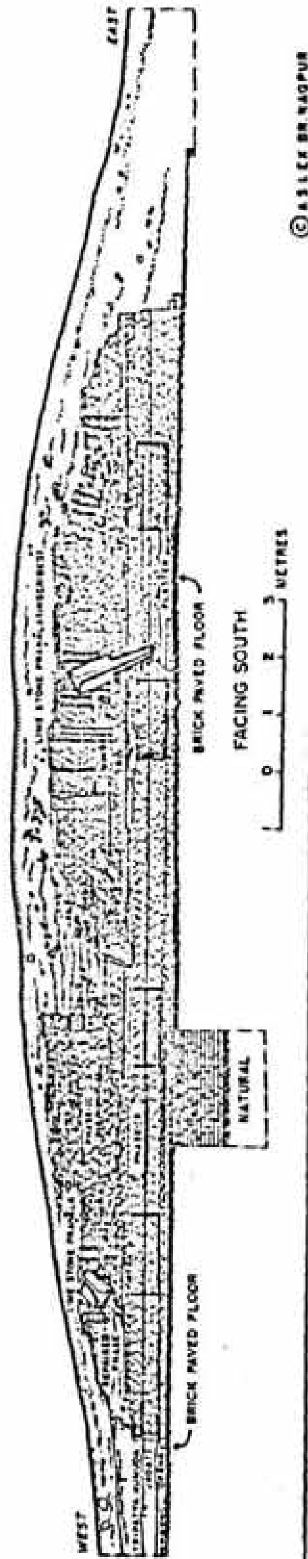


Fig. 6. *Peddavegi : Panchayatana complex, southern face pranala, Phase IB, fifth century AD*

with (pl. IV) disturbed brick courses. These *pranalas* possessed *gajasundas* and reused sculptured pillars of limestone with mid-octagonal sections, marked with lotus medallions at the terminals with running animal frieze. These pillars originally belonged to a Buddhist *mandapa* or alternately *ayaka khambas.* Both revealed Brahmi inscription on their border sections.

The pranala found from YAI, Qdt. 3 has only two letters in Brahmi characters of third century AD (pi. VA) reading *Dakshe,* Taksha meaning the carver while the other one from ZAI, Qdt. 3 and 4 possessed two inscriptions on its lateral facets in Brahmi characters of third century AD. These records clearly point out that the above pillar parts originally formed part of a Buddhist establishment at the place, though not the very site, and after decline of Buddhism, these very *mandapa* pillars were reused during sixth century AD by the renovators of the temple in its later phase. Thus Phase IB is to be regarded as coeval with the Vishnukundin rule in the area. The coin evidence amply confirms this sequence.

The two Brahmi inscriptions (pl. V B and C) found on the broader facets of the *pranala* slab provide an important account of the events of an earlier period. Though they have no bearing on the associated structure, they are of great importance to the early history and spread of Buddhism in Andhra.

The first one in five incomplete and partly-effaced lines occupied the lower register below the running tiger. The text reads :

Ratio Kakichikava maha
Ya atevasaka.......
ni yama hayaya........
ha atavasa Sara........
naga pavata la.......

The thickened head marks (wedges) and the squarish letter forms, the slender curve of the vertical ends of each letter *a, ka, ra,* characterize the later Satavahana Brahmi of third century AD and almost certainly of pre-Ikshvaku date. From this record for the first time; the name of Maharaja Kakichi is known. He was an *antevasaka* in monastery perhaps aligned to *Nagaparvata* i.e. *Mahanaga Parvata,* the great hill monastery of Guntupalle, located just 27 km north of Peddavegi.

The second record has the inscription in four horizontal lines and is very much worn out. Three more stray letters are traceable at the end of the shaft forming part of the fifth line. The text reads;

Padhana Pari gahe........
haghase a kici.......
...... ghaya.......
daha vasa bhuta ....

This inscription also reveals the name *(ka) kichi,* and refers to a *samgha,* apparently the Buddhist *samgha* mentioned above (No. 1). The phrase *dahavasa bhuta,* i.e. *dasavarshabhuta* meaning ten years past points out to the importance of the monastery of the place where perhaps the king stayed to learn Buddhist canon. On stylistic basis also the lotus medallion and the running animal frieze below clearly reveal the Satavahana art style.

To the south-cast of the Dhanam-Dibba, hardly 100 m away, adjacent to the camping-site, trenches H-10,Qdt.l and 3 and H-l1 Qdt. 1 were undertaken for excavation to unearth the ruined brick structures in the disturbed visible mound. A large size burnt pit with reddish earth indicated the existence of an open kiln either for burning the pots or for manufacturing of the bricks.

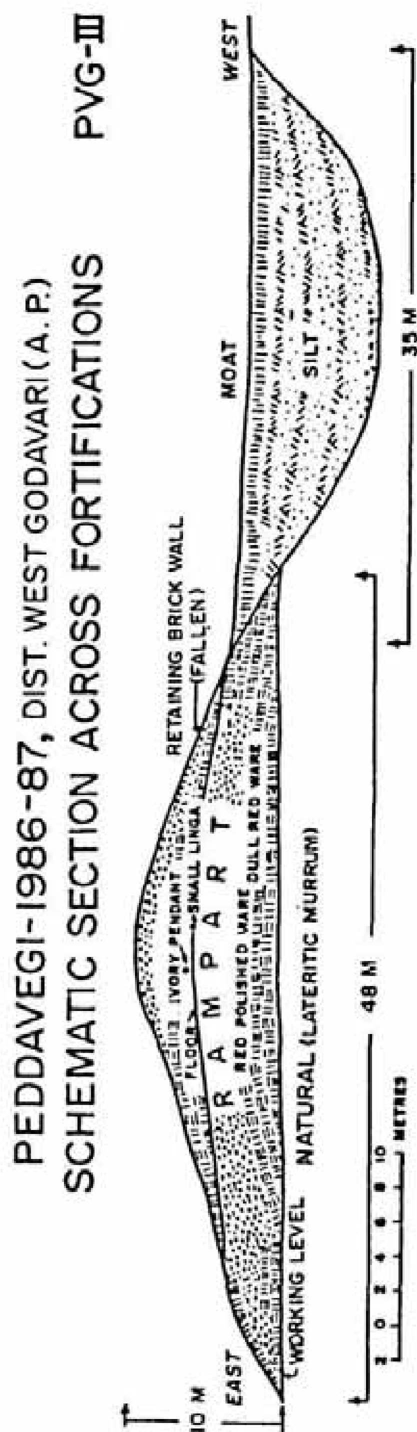


Fig. 7. *Peddavegi : Schematic section across fortification*

The finds included burnt clay figure of Ganesa measuring 7 cm in height and 6-2 cm broad with black slip uniformly all over the body, the legs and face bear clear theriomorphic features. The three stringed *yajnopavita* across the torso in *Upavita* fashion, and the seated posture emphasize the human feature. The example recalls the one obtained from a Dhanam-Dibba area during last season. A limestone plaque carved in bas-relief depicted a seated figure of Siva and Parvati (12 X 9 X 2.1 cm). With the third eye placed vertically between the eyebrows Siva is seated at ease alongwith Parvati *(sukhasinam sahomaya)* on a *manchaka adhishihana.* This alongwith a *Mahishasuramardini* plaque are datable to *circa* early fifth century AD. These small plaques of limestone representing Brahmanical deities are of great significance and point to emergence of popular cults after the Ikshvakus of Vijayapuri where in Siva-Parvati, Mahishasuramardini, Ganesa, Sakti and Sri have been separately worshipped in both symbolic and anthropomorphic forms by the people at large. Another red sandstone plaque (14.5 X 10.5 cm) represents Lakutapani. Among the minor antiquities mention may be made *of* beads, cubical dice of terracotta, ear ornaments *(cliakra-kundala)* characteristic of Kshatrapa-Satavahana times but surviving into the Salankayana period. Besides, a tabular dice of ivory and ivory .combs recall the famous examples of Begram. Copper coins were found from Period IB, most of them are of Vishnukundin lion and temple types. Pottery found from the earliest level include dull red, red slipped and a few red polished fragments. The site is devoid of black-and-red ware or any other diagnostic pottery of the Satavahana-Ikshvaku period.

The upper Phase IC heralds the early Chalukyan (AD 600-625) advent, the characteristic Vishamasidhi coins, with lion on obverse and stylized *srivatsa* between the ploughshares on the reverse, appeared along with large scale temple activity around Peddavegi.

Paramesvara Ternple (PVG-II): In order to ascertain the cultural sequence the area to the east and southern extents behind the Paramesvara temple was taken up for excavation and a basement of a temple made out of partially roughly dressed red sandstone blocks was traced.

The stones laid at the *upana* level possessed incised *manasutra* lines, indicative of the placement of *adhishthana* and *bhitti* mouldings above. A *linga-pitha* with its *nala* was found here. Further right below the stone wall (2.5 m b.s.) a brick floor was found.

At the southern end close to the Paramesvara temple, the excavation revealed apart from the foundational features of the existing stone temple, remains of two brick temples (pl. VI) at a much lower level. This complex facing west was provided with *garbhagriha, antarala, mandapa* and *ardha-mandapa.* In between these two brick structures, a passage measuring 3-5 m in length and 1-20 m in width was provided for circumambulation.

In additon to the fragmentary stucco work with floral design, the pottery consists of dull red ware and few sherds of red slipped ware.

Fortifications (PVG-III) A vertical trench across the fortification wall (fig. 7) at the south-western side of the village, was laid. It was dug up to the depth of 7.10 m from surface. The gravel make up of the fortification was nearly five metres thick raised on a working level. Careful exposition of this level revealed traces of temporary occupation of the site. Trial trenches of 2 X 2 m were taken up for excavation beyond the outer periphery of the mud fortification but no evidence of habitation was found. Important finds from the floor of working level included pottery of red ware, a rammed and partly burnt floor and hearth. A limestone miniature *linga* and an ivory spacer pendant of talismanic significance

were found. The gravel fort was strengthened at the end by a brick lining, traces of which were found along with western side. The fortification has perhaps four cardinal openings while the northern and eastern areas have been levelled up by the farmers. The western and southern extents are partly preserved. At the southern extent, besides a central passage, brick-lined wall indicating a postern gateway was noticed. A deep moat runs along the outer periphery of the fortification which is now turned into a village road.

As witness to the later historical events, Peddavegi yielded billon coins from the top layers. These coins belonged to two Delhi Sultans, Ala'ud-'Din Muhammad Shah-H of the KhaJji dynasty and Ghiyathu 'd'-Din Tughluq Shah, the founder of the Tughluq dynasty who ruled from AD 1296 to 1316 and AD 1320-1325 respectively.

Vengi and other pans of coastal Andhra were under the sway of the Delhi Sultanate by AD 1323.

ASSAM

20. EXPLORATION IN DISTRICT LAKHIMPUR.—The region between the Brahmaputra and the Arunachal Pradesh falling in District Lakhimpur was explored by the Department of Archaeology, Assam. A number of old ramparts and tanks were noticed but none appeared significant from its style and size.

At Rajakhana, 5 kilometers west of the Sub-Divisional town of Jonai, a fortified area was noticed. The area to the west and south of this fortification showed scattered stone pieces with clear chisel marks. Their limited number and plain workmanship point to the existence of a small stone temple of the medieval period. Further south of this fortification, ruins of a brick temple with carved stone doorsill, broken door jambs and lintels were salvaged.

At Bhura-Chapari on the bank of the river Tuni, about 12 kms south of Jonai exist a few moderately large stone sculptures within an area enclosed by a rampart. At present only a part of the northern rampart is visible, the rest of the area has been eroded by the Tuni river.

The late medieval brick-built temple at Ghuguwa near the town of Ghilamara, is 10 metres in height and octagonal in plan. Its dome is completely covered by vegetation. The *do-chala mandapa* has also developed cracks at places. The structure is of typical Ahom style. The other temple, also brick-built, is only 2-10 metre high and is located at Bagharchuk. It is octagonal in plan. Its cubical interior is too small to allow a person to stand inside. About 10 metres away from this temple exists a brick-built stepped plinth, rectangular in shape. It has four steps with slightly curved edges, perhaps to place an image during festive seasons.

Ruins of a small stone temple were noticed at Goshain-pukhuri near the *moffusil* town of Laluk.

S.K. Choudhary of the Survey discovered two sculptured-stone pillars (measuring 104 X 0.28 m and 0.74 X 0.21 m) at the village Rajakhanagarh under Jonai Block. These pillars belong to the pre-Ahom period.

BIHAR

21. EXPLORATION IN DISTRICTS BHAGALPUR, RANCHI AND SARAN.—Saptarshi Kumar, K.P. Chaudhary and K.C. Srivastava of the Patna Circle of the Survey, carried out village-to-village survey and brought to light the following sites of archaeological interest:

District	*Village/Site*	*Nature of remains*
Bhagalpur	Tangesar	Ancient mound with grey and brown potsherds
Ranchi	Anandi	*Siva-linga*
Saran	Afaur	Ancient mound
-do-	Kahina	Northern Black Polished Ware
-do-	Kanda	Ancient mound
-do-	Khairam	Tank and ancient mound
-do-	Naran	Ancient mound
-do-	Pathedha	Medieval fort
-do-	Sadhpur	Tank and ancient mound

22. EXCAVATION AT TARADIH (BODH GAYA), DISTRICT GAYA.—In continuation of the last season's work *(1985-86,* pp. 7-9), Ajit Kumar of the Directorate of Archaeology, Government of Bihar, assisted by S.S. Singh, D.P. Gupta, Sanjiv Ranjan, R.S. Singh, L.B. Mishra, Md. Sarfuddin, Md. Akrar, S.D. Roy, Amitabh Roy under the general guidance of Sita Ram Roy and N. Akhtar resumed excavation at Taradih (Lat 24° 42'; Long 85° 0') located to the south-west of the Mahabodhi temple. The main aim of this year's excavation was to reveal more details of the protohistoric occupation and to ascertain the lay-out of the monastic complex of the Pala period. The excavation further confirmed cultural periods as noticed earlier.

Period I is neolithic and represented by a 70 cm thick cultural deposit accumulated on the virgin soil. On the basis of pottery the neolithic period may be further sub-divided into two phases viz. phase A and B.

Phase A was associated with handmade red pottery represented by both burnished and plain specimens, the types being vases, bowls, jars, etc. A few examples of cord-impressed sherds were also encountered.

Phase B was marked by the appearance of burnished grey ware though the red ware of the previous phase still continued. The ceramic industry of this phase was handmade but a few wheel-turned examples were also found. The main pottery types included *fiandis,* vases, bowls, jars, etc. The cooking utensils had usually rusticated bases.

The stone antiquities included an adze, pestles, a fire producing stone and groundstone.

Period II represented the chalcolithic horizon of the site. The pottery of this period was predominantly wheelmade though handmade pottery was also in use. The period was distinguished by the appearance of copper, black-and-red ware and the absence of the cord-impressed potsherds of the preceding period. The pottery usually bears thick slip of different colours like chocolate red, light red, deep red, brick red and orange to ochre red. The dominant pottery was the red ware, though black and red ware and black ware were also found in good numbers.

The pottery types included dishes-on-stand, bowl-on-stand, dishes with incurved or straight-sided rim, lipped bowls, bowls with globular profile and outcurved or featureless rim, vases, storage jars, basins, etc. Some pottery pieces bore white paintings in the form of wavy lines, oblique strokes and

dots. A few potsherds were decorated with incised designs such as horizontal lines, criss-cross, diamond, etc.

Among the antiquities, notable are beads and a terracotta disc, balls, grinding stones, pestles, celts, stone disc, bone arrowheads, points needle, etc. A copper ear-ring deserves special mention. Good number of micro-beads of steatite were picked up in course of excavation.

Period III was marked by the appearance of iron. The black-and-red ware, black ware and red ware of earlier period continued in this period as well. Pottery was made of well-levigated clay and was well-fired, and was of medium to fine fabric. Paddy husk was used as grit in storage jars. Some of the black-and-red ware sherds had glazed surface. Black-slipped and grey wares also make appearance in this period. The pottery types included vases, *handis,* rimless *handis,* storage jars, plain bowls, *lota*-shaped bowls, basins, lipped bowls, etc.

Among notable objects of iron, mention may be made of nails and knives. Beads, balls, celts, pestles, etc., of stone were also encountered. Noteworthy bone objects were arrowheads, points, terracotta beads, dabbers, mother goddess figurine, an amulet, and large number of micro-beads of steatite.

Period IV was distinguished by the appearance of the Northern Black Polished (hereafter NBP) Ware. Black-and-red ware still continued to be in use but its frequency is less. Black-slipped and red-wares, both plain and slipped, with several new shapes were also noticed during this period. The important types included vases, dishes, bowls, lid-cum-bowls, trough, etc.

Among objects of iron the important ones are arrowheads, nails, knives, sickles, rods, and in stone were beads, balls, hammer, etc. The bone arrowheads,; points, a bead, a die, a lance bead, etc. are also noteworthy. Among terracotta objects mention may be made of beads, dabbers, gamesmen, bangles, balls, animal figurines, snake figurines, ear-ring, sealings, etc. Other important antiquities were bangles, a finger ring, copper stylus and shell bangles. A number of steatite beads were also found.

Period V was represented by Kushana red ware, comprising of sprinklers, frying pan with handles, *surahis,* flat-based bowls, terracotta beads, .gamesmen, balls, animal figurines, ear ornaments, stone ball and beads, nails and knives and bone arrowheads, points, etc.

Period VI was distinguished by the appearance of Gupta and late Gupta antiquities, structural remains of burnt structures probably representing a monastic-complex. The notable objects of the period are terracotta beads, dabbers, gamesmen, bangles, balls, animal figurines, a human head, seal and sealings. Among the stone objects were votive stupas, beads, balls etc., and iron is marked by the nails, needles, kinves, bar celt etc. Other important objects were arrow heads and bangles of bone and a copper antimony rod.

Period VII exposed remains of a monastery of Pala period made of burnt bricks. The important objects were beads, dabbers, gamesmen, a ball, an animal figurine, a hooded snake, seals, sealings, of terracotta; beads, votive stupas, *chhatravalis,* a female attendant, a Stella, a female deity of stone; bangles and points of bone; beads and bangles of glass; iron nails; bangles and arrowheads of copper, and shell bangle.

23. SCIENTIFIC CLEARANCE OF THMPLE, LAKHISARAI, DISTRICT MONGHYR.—Hari Manjhi of the Patna Circle of the Survey assisted by Sunil Kumar and T.K. Srivastava conducted scientific clearance work at Ashok Dham, Lakhisarai.

In the course of clearance *upanchayatana* temple was exposed. The subsidiary shrines, at the four corners of the temple, have not survived. On plan it resembles the Latin-cross with usual transepts. The floor of the temple was of baked bricks (32 X 24 X 6 cms) set in lime and brick-jelly mortar. The shrine chamber is 7-78 m square, the walls 1.50 m wide and made of large-sized bricks set in mud mortar.

During the course of the work, fragmentary stone slabs, pillars and sculptures in basalt were found. The remains at the site can be placed between tenth and twelfth centuries AD on the basis of the sculptures.

24. EXCAVATIONS AT PAISRA, DISTRICT MONGHYR.—In continuation of previous year's *(1985-86,* pp. 9-11) work, P.C. Pant and Vidula Jayaswal of the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, concentrated this season in the locality G, situated at a distance of about 400 metres west of Paisra village.

The excavation revealed as many as about a dozen stone alignments alongwith three post-holes. These stone alignments are either straight or roughly semi-circular in shape and their measurement ranges from about 1 m to 3 m. It is important to note that almost all these stone formations are also associated with Acheulian implements including handaxes and cleavers, though their number is comparatively smaller than those found in the workshop areas.

25. EXPLORATION IN DISTRICT MONGHYR.—Hari Manjhi, assisted by Sunil Kumar of the Survey, discovered a large number of black basalt sculptures and architectural fragments belonging to Pala period in Rajona and Balgudar villages.

26. EXPLORATIONS IN DISTRICTS MUZAFFARPUR AND ROHTAS.—Hari Manjhi, assisted by Sunil Kumar of the Survey discovered a twin earth mound and ring-wells in village Kushi.

Sunil Kumar noticed a Lakulisa image of late Gupta period at Sasaram in the office premises of the District Magistrate, Rohtas.

27. EXCAVATION AT MANER, DISTRICT PATNA.—In continuation of last season's work *(1985-86,* pp. 11-12), the Department of Ancient Indian history and Archaeology, Patna University, resumed the excavation at Maner. The work was directed jointly by B. Narayan and A.K. Singh under the overall supervision of B. Sahai with the assistance of J.P. Singh, L.K. Prasad, R.N. Singh and P.K. Bose.

The main objective of this year's excavation was to ascertain the cultural sequence of the extensive mound to the north of the excavated trenches. Three trenches, each measuring 6 X 4 m, were laid out on the western end of the mound to the north-west of the village.

Excavations at the site revealed four cultural periods as against the threefold cultural sequence noted earlier. Period I is mainly represented by a 78 cm thick chalcolithic deposit resting over natural soil. The pottery of the period is represented mainly by black-and-red, black andred wares. The black ware sherds, however, are crude and their frequency is more in the lowest layer (12) resting over natural soil. The red ware sherds include fine slipped and plain specimens. The main pottery types include lipped bowl, spouted vessel, vase, stem of dish-on-stand in black-and-red ware, small vase and small to medium-sized jars. The associated antiquities comprise microlithic tools, stone and terracotta beads and fragments of bone points. Among stone objects mention may be made of points, blades, fluted cores and waste flakes. No evidence of copper has been found from this period.

Period II is represented by 2.92 m thick deposit of the NBP phase. The lower levels of this deposit have yielded fine varieties of NBP sherds with thin section in various shades such as silvery, golden, steel blue, violet, black, etc., while its upper layers have yielded coarser variety of NBP sherds along with finer specimens. The associated wares of NBP include the black slipped, grey, black-and-rcd and red wares. A terracotta ring well consisting of eight courses of rings with a diameter of 74 cm was found to be associated with the upper layers. The antiquities obtained from the NBP deposits comprise iron objects, terracotta sling balls, bone stylus, terracotta and stone beads.

Period III is marked by the remains of two walls forming part of a room-like structure at the southern end of the trench. Both the walls, which meet at right angles, form two arms of the room and run from north-west to south-east and south-west to north-east. The wall running from north-west to south-east measures 2.70 m in length, while the other, running from south-west to north-east is 2.40 m in length. A single brick wall measuring 2.70 m in length running from noith-west to south-east was also found in the northern end of the trench. The bricks used in the construction of these walls measured 44 X 26 X 5 cm. All the above walls were sealed by layer 3, which yielded, in addition to the red ware sherds, some iron objects including a spearhead, bone point and cast copper coin of thick variety usually dated between first century BC to first century AD.

Period IV is characterized by a massive brick structure of Pala period showing the plan of a number of room-like structures and a complete room with floor. In the central portion of the trench the plan of an almost complete room with four walls and a floor was found. The room was rectangular in shape and measured 4.58 m in length and 2.60 m in breadth. The floor was made of *surkhi* and lime and was connected with a brick drain running from north to south but took a turn towards west at a distance of 1.70 m from where it started. The brick drain was 4.35 m in length and 20 cm in breadth. Towards the northern side of the above room, remains of a two-roomed structure showing only two side walls of the rooms came to light while towards its southern side the plan of a single room-like structure showing only two walls were noticed. The entire structural complex was sealed by layer 2 which has yielded in addition to the red ware and grey ware sherds, a fairly good number of antiquities such as terracotta and stone beads, terracotta bull and other animal figurines, skin rubber, car lobes, sling ball, decorated bangle and votive tank, iron nails and bone points. The topmost layer has yielded mixed materials of different kinds including early medieval green glazed sherds.

28. EXCAVATION AT SENUWAR, DISTRICT ROIITAS.—The Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, in collaboration with the Birbal Sahni Institute of Palaeobotany under the direction of Birendra Pratap Singh assisted by L. Misra and J.R. Singh and S.K. Saraswat carried out the excavation at Senuwar.

The site (lat. 24° 56' N; long. 83° 56' E) is located 7 km south of Sasaram and situated on the right bank of the river Kudra which flows approximately 1 km away from the site. The ancient mound measures 300 m east to west and 360 m from north to south, and rises to the maximum height of 9 m from the ground level. The excavation revealed deposits of four cultural periods.

Period I (Neolithic) is divisible into two sub-periods IA and IB. IA was metal-free and can be regarded as pure neolithic, while in IB all the basic cultural traits of IA continued with the addition of metal.

Sub-period IA was represented by a 1 .50 m thick deposit and was characterized by the occurrence of burnished grey, burnished red and coarse red wares. The burnished grey ware showed an ochre colour painting on the rim portion which has the tendency to rub off easily and gives the impression of its being post-firing The pottery of this sub-period was mainly wheel-made, although handmade specimens were also found in sufficiently large quantity. Occurrence of a rusticated ware and the cord impressed pottery were the other noteworthy features of the ceramic assemblage of sub-period IA. The pottery shapes included wide-mouthed shallow bowl, channelled bowl, bowls with varying profiles, vases with concave neck, spouted vessels, etc.

The lithic appendage included microlithic tools, viz., bladelet, bladelet having retouched top, incomplete scalene, drill with broken tip, partially backed point, blades, flakes, cores, worked nudules, debitage, etc. The materials used in the manufacture of these tools are chalcedony, chert and milky quartz. Among other lithic objects mention may be made of hammerstones, pestle, saddlequern, rubber stone, sling balls and disc, besides finished and unifinished beads of agate and chalcedony. The bone tools appear to have been shaped out of long bones or splinters. Of special mention is a point with use mark at the working tip and a blade (?).

Animal bones were found in large number. Most of these were charred and bear cut-marks revealing the food habits of the neolithic folk. Specimens of rice, barley, lentil and wheat have been recovered. Wheat was introduced towards the end of the sub-period IA.

Among objects of terracotta, mention may be made of edge ground potsherds, beads and baked lump of clay of indeterminate use. Due to limited area undertaken for excavation not much information could be gathered about their house building activity. However, the occurrence of burnt clay clods with reed marks provided a glimpse of their settlement pattern.

Sub-period IA was followed by sub-period IB, without any break. It was represented by 202 m thick strata and was marked by the appearance of copper objects like a fish-hook, wire, a needle and an indeterminate object.

The pottery of the preceding sub-period continued ; however, it shows marked improvement in surface treatment. The use of fine quality of slip and high grade burnishing provided a striking finish to the vessels. Post-firing ochre colour was noted in the burnished red and red wares. The painted designs consisted of simple linear pattern, mostly on the rim. In some of the burnished grey ware specimens, bands were noted on luting point. Pottery with rusticated surface was noted in coarse red ware. The cord-impressed pottery of this sub-period shows greater variety.

Apart from painted designs, the pottery was also decorated with thumb or finger impressions, rope, notched, cut patterns, etc., on applique bands of clay. Post-firing scratched designs were also met with. The scratched surface in some cases was filled with ochre colour pigment.

Although wheelmade pottery dominates, handmade pottery was also present. In all the wares of the period, bowls outnumber the other types. Noteworthy shapes included deep bowl, bowl with convex, spherical and straight sides of varying dimension, channeled bowl, lipped bowl, spouted vessels, storage jars and vases of varying shapes.

Among the stone artifacts, polished stone celts of black basalt in varying stages of manufacture, microliths comprising deniticulated bladelets, retouched bladelets, straight-backed bladelets, partially-backed bladelets, obliquely-backed point, blades, flakes and retouched flakes, geometric tools such as

scalene and trapezes, fluted cores and lumps of raw material are important. A characteristic feature of the microlithic industry in both the sub-periods at Senuwar was that of the tools were made on bladelets.

Other stone objects such as hammerstones, rubberstones, pestles, saddle querns, sling balls, disc, etc., noted in the preceding sub-period continued; a new entrant was a sharpener, rectangular in shape made of black basalt. Objects of shell were generally used for personal adornment. It comprised of pendants of different forms and shell cut and edge ground to a triangular shape.

The occurrence of finished and unfinished bone tools alongwith waste material was the most significant discovery of the sub-period. The finished tools comprised chisels of varying shapes and sizes, borer and points, the working edges and tips of these tools were polished.

The other notable antiquities included finished and unfinished beads of agate and camelian, a micro-bead of red jasper, twenty-five beads of polycrystalline glazed ware, and terracotta objects such as bull figurine^ whistle (?), rectangular broken object with two perforations, circular burnt lump of clay, beads, hopscotches and miniature rectangular cake.

The excavation revealed remains of successive floors, made of well-rammed earth mixed with *kankar* and potsherds. In one example, the top of the floor was found covered by a thin layer of black sticky clay. Four post-holes varying in diameter and depth from 10-15 cm and 10-34 cm, respectively were also noticed. Recovery of burnt, lumps of clay with reed marks on these floors indicated that the superstructures built on these floors were of wattle and daub.

Period II (chalcolithic) was represented by 1.70 m thick deposit. The ceramic industry of the preceding period I did not continue in this period. The pottery of this period is represented by black-and-red ware (plain as well as painted), burnished black ware (plain and painted), black-slipped ware, slipped and unslipped red ware and black painted red ware commonly known as black-on-red ware. The motif consisting of lattice design and group of wavy verticals was found painted on both sides of the pot. The bowls are the only identifiable type in the ware. The important types occurring in different fabrics consist of channeled bowl, deep bowl with straight or convex sides and round base, dishes, vases with flared rim, storage jar, etc. The occurrence of black-on-red was not only first of its kind to have been noticed in this region but showed resemblance with the chalcolithic ware of central India.

The lithic assemblage consisted of bladelets, partially retouched bladelets, flakelets, fluted cores, waste chips, sling balls, hammerstones, pestle and rubberstones. Among other objects, mention may be made of a copper piece, beads of semi-precious stone and terracotta hopscotches. A marked change was noticed in the types of bone tools.

Period III witnessed the introduction of iron and the NBP ware in golden and silvery shades. Quite a few painted sherds akin to Rajghat specimens were also found. The other associated wares are red, black-slipped and black-and-red. The types included flanged, corrugated and convex-sided bowls, dishes, basins and vases with varying profiles.

On the eastern periphery of the mound traces of a massive clay structure and a ditch cut in the natural soil was found. This was perhaps a mud rampart or a bund along with a moat. However, its exact nature and association with specific period remains to be ascertained.

Period IV was represented by the ceramics of Kushana period. The excavation revealed fragmentary remains of brick walls and floors of a residential complex. The most remarkable discovery was a large-sized terracotta figurine of a female deity including beads of stone, iron implements, terracotta balls and wheels.

GUJARAT

29. EXPIRATION IN DISTRICT KUTCII.—In continuation of the previous year's work *(1985-86,* pp. 15-19) exploration was conducted in District Kutch of Gujarat under the direction of R.S. Bisht, assisted by B.R. Mccna, L.S. Rao, Y.S. Rawat and Ravinder Kumar. Thiny villages in Anjar and Bhachau .talukas were covered and fifteen sites bearing antiquarian remains ranging from protohistoric to late medieval period were brought to light. The sites of archaeological interest are as under :

Taluk	*Locality*	*Site*	*Nature of remains*
Anjar	Baniyari	Juna Baniyari (23° 23'; 70° 11')	Medieval
-do-	Bhimasar	Bhimasar (23° 12'; 70° 10')	Medieval
-do-	-do-	Chakasarao Talav (23° 13'; 70° 10')	Early historical
-do-	Devisar	Juna Bandar (23°20'; 70°08')	Medieval
-do-	Dhamadka	Juna Dhamadka (23° 19'; 70°09')	Medieval
-do-	Dudhai	Jagaroh (23° 21'; 70° 11')	Late Harappan and medieval
-do-	Meghpur	Paria, Waro Mohra (23° 06'; 70° 05')	Late Harappan and medieval
-do-	Miti Rohar	Patel Raniji ka Magsa (23°06';70°H')	Late Harappan
Bhachau	Chirai Mota	LakhasarI (23°14';70°;41')	Harappan
-do-	-do-	Lakshar II (23°14';70°41')	Harappan
-do-	Chirai Nana	Ukedo (23° 13'; 70° 14')	Historical
-do-	-do-	Memavida no Mohra (23°13';7O°13')	Medieval
-do-	Chobari	Mandriyara Mohra (23° 30'; 70° 16')	Harappan and medieval
-do-	Chopadwa	Juna Chopadwa (23° 16'; 70° 15' 30")	Harappan
-do-	-do-	Rutro. (23° 16'; 70° 16')	Historical

30. EXPLORATION IN DISTRICT SURAT.—During the course of exploration, Vilas Jadhav of the Vadodara Circle of the Survey brought to light the following sites of archaeological interest:

Taluk	*Site/Village*	*Nature of remains*
Nijhar	Ashrva	Chalcolithic
_do-	Balda	Chalcolithic and medieval sculpture
-do-	Chichoda	Chalcolithic
-do-	Hatoda	Late medieval Siva temple
-do-	Kandarai	Microliths
_do-	Kavatha	Late medieval sculpture of Vishnu
_do-	Nimbora	Medieval sculpturesofParvati.Uma-Mahesvara and Siva
-do-	Pimpalas	Medieval
-do-	Sadgavan	Medieval
-do-	Shelu	Medieval sculpture
Songad	Chikhali	Medieval Hanumana temple and sculpture
-do-	Dhajamba	Microliths
-do-	Doswada	Step-well, fortress and medieval inscription
-do-	Khanjar	Microliths
-do-	Khirwada	Late medieval fortress, pond, sculptures, hero-stone and cannons
Uchhal	Andadpur	Late medieval fortress
-do-	Babarghat	Wooden memorial pillars
-do-	Bhind-Khurd	Wooden memorial pillars
-do-	Chandpur	Microliths
-do-	Khabda	Hero-stone and dam site
-do-	Lalmati	Wooden memorial pillars
-do-	Manikpur	Medieval Hanumana sculpture
-do-	Mohani	Wooden memorial pillar
-do-	Narayanpur	Hero-stone and wooden memorial pillar
-do-	Tothi	Late medieval sculpture
-do-	Vadapada	Wooden memorial pillars
-do-	Waghsepa	Wooden memorial pillars
Vyara	Borkhas	Microliths
-do-	Chunawadi	Microliths
-do-	Padam Dungari	Medieval temple
-do-	Umarav-dur	Wooden memorial pillar

31. EXCAVATION AT NAGWADA, DISTRICT SURENDRANAGAR.—In continuation of last year's *(1985-86,* pp. 20-21) work, K.T.M. Hegde, assisted by V.H. Sonawane, K.K. Bhan, K. Krishnan, Ajit Prasad and

S. Pratapachandran of the Department of Archaeology and Ancient History, M.S. University, Baroda, resumed excavation at Nagwada with the objectives (1) to know the complete plan of the mud-brick and rubble structures exposed in the last season, (2) to continue investigation of the burials, (3) to unearth more details of the semi-precious stone beads and shell bangle manufacturing industries at the site and (4) to expose more area of the settlement.

In the course of the excavation, an extended burial and pot-burial each were exposed. These burials belong to the earliest settlers of Nagwada. Shapes of many of the vessels found in the burials resemble the pottery forms of the Kot Dijian types. These pottery forms have been found in Gujarat for the first time. Surprisingly, sherds of these Kot Dijian type pottery are not encountered on the floors of the structures so far exposed.

A number of typical Harappan miniature vessels containing copper ornaments or semi-precious stone beads were found buried below the house floors, but the sherds of Harappan pottery remained limited. The non-Harappan pottery like the coarse gritty red ware and white-painted black-and-red ware were found to be predominant in all the levels. An urn-like jar with a bowl used as lid appears to represent an urn-burial.

This season's excavation has yielded more evidence to support the observation made last year that craftsmen manufacturing semi-precious stone beads and shell bangles, inlay and pendant worked at Nagwada. A number of finished agate beads along with a large number of unfinished ones at different stages of production and several intact and broken chert drill-bits, polished and unpolished *Turbinella pyrum* shell circlets, the polished ones having 'chevron' mark, finished and unfinished shell inlay pieces and pendants and shell beads were recovered in the excavation this year.

Among the other important finds of the season include a stone weight, an etched carnelian bead, a gold object and silver spiral rings.

32. EXPLORATION IN THE ORSANG VALLEY, DISTRICT VADODARA.—Ajit Prasad of the Department of Archaeology and Ancient History, M.S. University, Baroda, under the guidance of K.T.M. Hegde carried out an exploration in the Orsang Valley between Bodeli (21° 16' N; 73° 43' E) and Sankheda (21 ° 10' N; 73°35' E). The survey was aimed at understanding the land use pattern and palaeoenvironmental conditions at different stages of human occupation starting from the lower palaeolithic to the Mesolithic period.

The Lower Palaeolithic sites were found at Mosabar (Locality, I), Laphni (Locality, I to VI), Duma (Locality, I and II), Baskario (Locality, I and II), Uchhet (Locality, I and II), Uchhakalam, Bahadarpur, Chuchhapura and Wadeli. All these sites except the last three were occupational sites confined to the north-western margin of the valley located in an area of 5 sq. km in the foot hill zone of the Mosabar and Baskario hillocks near Bodeli. The tools were found in clusters in areas measuring roughly .100 to 500 sq. metres, in the open land at the foot of the hillocks. Almost all the sites have yielded a large number of waste flakes, quartzite blocks, large flakes and unfinished handaxes and cleavers in association with regular Acheulian artefacts. Stratigraphically this Acheulian tool-bearing horizon, which was a cobbly gravel deposit having 15 to 50 cms thickness, was overlaid on the basal rock as seen in the sections of the recently dug up wells in this area. At many places this horizon was covered by a 0.5 to 2 metre thick deposit of black soil. The Acheulian industry here was dominated by large, medium

and smaller handaxes. Other tool types like cleavers, scrapers, knives were al so in abundance. The tools were generally made on quartzite though occasionally quartz tools were also met with. The abundance of Acheulian tools having regular outline, thin cross section and refined workmanship suggest an advanced stage of the industry. The occurrence of pointed handaxes with thick butt-end and cross section and less regular outline, alongwith thin ovates, at Mosabar and Laphni indicate cither a prolonged or intermittent occupation of the area by the Acheulian communities. Another interesting feature of the industry was the presence of extremely small (6 to 10 cm long) handaxes and scrapers at Baskario (Locality II) and Uchhet (Locality I and II). The tools, including small flakes found at these sites were mostly smaller and which seem to be reminiscent of the Middle Palaeolithic lcvallois flakes. However, no stratigraphic evidence was available to attribute a cultural evolution in correspodcncc with the progressive attenuation of tools in the region.

Mesolithic tools were found at Pipalsat, Handod, Piperia, Talioghoda, Nagro Tikyo, Manpur, Jopa, Dunkri, Kuselpur and Monpur. All the above sites are located in the Orsang-Unchh intcr-rivcrinc alluvial plain. Besides, sites were also found at Jojwaghode, and Duma (Locality I, II and HI) at the foothill zone of Mosabar and Baskario hillocks. The surface spread of Mesolithic remains varied considerably from 200 to 1000 sq. meters. Agate and chalcedony were the two most preferred raw-materials followed by chen and fine quanz. The tools included lunates, triangles, trapezes, a variety of backed blades, burins, borers, arrowheads, scrapers, especially those made on larger flakes and blades in association with large number of cores, blade-blanks, waste flakes and nodules. Many sites have pieces of animal bones, both charred and uncharred.

HARYANA

33. EXCAVATION AT BANAWALI, DISTRICTHISSAR.—In continuation of previous year's *(1983-84),* pp. 24-28) work, the Excavation Branch V of the Survey resumed excavation at Banawali under the direction of R.S. Bisht, assisted by L.S. Rao, Y.S. Rawat,V. H. Parmar, Ravinder Kumar, M.S. Rawat and A.R. Mehta of the Branch, Ashok Patel and Vijay Shankar of the Srinagar Circle and Kishan Singh and B.R. Rajput of the Headquarters office of the Survey. The aim of the excavation was to know the pre-Harappan and Harappan defence system and their stratigraphic relationship; tounderstand the town planning of the Harappan citadel; and to determine the extent of the post-Harappan settlement.

While confirming the previous sequence, the present excavation established the existence of new phase between the pre-Harappan and Mature Harappan deposits. This new phase, which marks the transition between the pre-Harappan and the Harappan has been included as Period IC.

Period I (pre-Harappan) : There was initially (Period IA) an open settlement which was subsequently (Period IB) enclosed by a wall made of mud bricks (pl. VII). The fortification wall was ascertained in two areas, one each in the north and the south. However, complete outline could not be determined due to resistance of local farmers.

Among important antiquities discovered mention may be made of beads of lapis lazuli, carnelian, steatite and clay; terracotta bangles of grey fabric bearing incised patterns and those of red fabric having decoration in black; a bone handle probably for drill bits; fragments of two bone spatulae; and one copper fish-hook and arrowhead each.

Period IC (Transitional phase) brought about such sweeping changes which herald arrival of new ideas and material. It is denoted by a 0-90 to 1-20 thick deposit and is marked, as already mentioned above, by drastic and diagnostic changes in architecture, planning and antiquities in an otherwise continuing cultural milieu of the preceding period. The entire settlement was planned and constructed dc novo. The dichotomous layout which the Harappans adopted was introduced during this sub-period. The fortification of the previous period was externally chiselled or partially sliced away and doubled in width for housing the citadel, and the lower town was laid out contiguously towards the east as well as the north, while the position in the west remained unresolved. The bricks, by and large, were moulded into new measurements giving the ratio of 4:2:1 in respect of length, width and thickness. Such standardized bricks were introduced and popularized by the Harappans in all the areas wherever they settled outside the Sind. At several places it was observed that the orientation of houses of the preceding phases was modified or changed altogether. Triangular terracotta cakes and roughly 8-shaped clay nodules, both being much different from, the usual examples of the mature phase, made their appearance. Both are much larger in size, coarse in fabric and blackish grey in colour. In many cases, there are cross-marks on the cakes while on the nodules there are pinched marks on the waist. The chert blades made their debut, and there was substantial increase in steatite beads, red-coloured bangles and assorted antiquities all of which continue, with increased numbers, in the following period, i.e., Period II. Lastly, there appeared some proto-Harappan forms with crimson red slip in the continuing ceramic corpus of the preceding phases. It was, however, noted that in the pottery of this phase, the pre-Harappan painted motifs tended to become simpler and sparse and use of white pigment became less popular progressively.

Furthermore, there were, of particular interest, a few curious structures which appear to be apsidal in form with a smaller apsoid for a fire-place near the apex (pl. VIII A). Those were found in damaged condition but were present at different levels, particularly nearer to the defensive wall in the north of the citadel. Interestingly, two drill bits made on chert blades were recovered from the associated levels indicating" in a way an industrial use of those ash-laden apsidal structures. Significantly, house walls of this phase have also been found outside the general fortification in the east. A rare find was a smoky crystal having multiple facets. It showed a high degree of technical skill.

Period II (Mature Harappan): The eastern gate complex (pl. VIIIB), partially exposed during the previous year, was brought into bolder relief. Both the tie-wall and the drain (pl. IX A) had shown at least three phases of rebuilding.

In the citadel, street 11 alongwith its flanking houses (pl. IX B) was exposed to a length of 20 m. Significantly, three bathing platforms, made of fired bricks were exposed.

Another significant feature' was the provision of square grooves cut vertically and distributed evenly on the outer faces of two contemporary houses (pl. XA), facing each other on either side of the above-mentioned street. Possibly, those grooves were meant for fixing wooden posts in order to support a superstructure projecting over the street. In this context, too, there was found a fairly large elliptical structure with a small apsoid within the northern apse and a large jar and a fire-place at the other end (pl. XB). It was full of fine loose ash.

Among the important finds are included two terracotta addorsed bulls (pl. XI A), human and animal figurines (pls. XI B and XII A), seals and sealings (pls. XIIB and XII C) and stamped cakes;

copper objects (pl. XIII); gold pieces; weights, etc. The most significant finds (pl. XIV) arc the lower jaw of a young elephant from the inner bank of the moat and two skulls of bulls from the moat itself. Period III (post-Harappan) is marked by the presence of house floors, a few circular storage pits, large terracotta beads probably once stringed together, faience bangle pieces and fragment of an animal figurine.

34. EXCAVATION AT BALU, DISTRICT JIND.—In continuation of previous year's work *(1985-86,* pp. 29-30), U.V. Singh, Suraj Bhan, S.B. Singh, S.P. Shukla and Arun Kesarwani of the Department of Ancient Indian History, Culture and Archaeology, Kurukshetra University, Kurukshetra, resumed the excavations with the objective to trace the Harappan fortifications.

In all, five trenches (C EXT 5, A EXT 4, AX EXT 4, BX EXT 4 and CX EXT 4) were laid on the northern side of the mound to further expose the northern citadel wall. The trenches were partially excavated. In trench C EXT 5, whose southern half was excavated, the inner side of the wall was exposed. The straight-sided'wall had seven courses of mud bricks and measured 95 cm in height. In the next trench (A EXT 4), a diagonally running mud brick wall was exposed. In the next trench (AX EXT 4) the inner side of the citadel was exposed and it measured 60 cm in height. The disintegrated mud brick material came across through the other two trenches (BX EXT 4 and CX EXT 4). Its nature, however, remains to be ascertained. Among the antiquities mention may be made of beads of agate, steatite, faience and terracotta; terracotta triangular and circular cakes, nodules and toy-cart wheel; and bangles of shell, faience and terracotta. The Harappan pottery was found associated with pottery of pre-Harappan tradition.

35. EXCAVATION AT KHOKHRAKOT, DISTRICT ROHTAK.—The Department of History, Maharshi Dayanand University, Rohtak, under the direction of Silak Ram assisted by Manmohan Kumar and Amar Singh carried out excavation at Khokhrakot with the objective to examine the cultural sequence of the site and to know the details of various aspects of the township, known as the mint site of the Yaudheyas.

Two trenches KKT-I and KKT-II were taken up for digging. The excavation revealed fourfold cultural sequence.

Period I (layer 44 to 36) was characterized by the occurrence of Painted Grey Ware. The total deposit was 1-60 m. The pottery was of medium fabric. The common shapes were bowls and dishes of various types including straight-sided bowls with flaring rim. The paintings were mostly in black colour, but a few sherds having white and chocolate colours were also found. A few sherds of grey ware having black slip were also found right from the earliest levels. The associated red ware was of medium and coarse fabric. The common shapes were jars of various types, bowls with round incurved rim, miniature pots, basin, etc. The objects included bone styli, terracotta discs, wheels, *ghata-shapcd* beads, flesh rubber and animal figurines. An iron scythe from layer 38 was an important discovery. No structural activity was noticed.

Period II (layer 35 to 28) was characterized by the introduction of the NBP and associated wares. The cultural deposit was 2 m. The Painted Grey Ware (PGW) with reduced percentage continues up to layer 33. The main pottery of the period was plain grey and black-slipped grey wares. The NBP ware

was represented by only a few sherds. The grey ware was of coarse to medium fabric. Sherds painted in black on the exterior indicated the continuity of PGW tradition. A few sherds with incised chequer pattern on the outer surface is a noteworthy feature. There was no marked difference in the shapes of red ware from Period I to II except that the percentage of this ware was increased. Slags, nails and rings in iron and copper rings, etc. form the metal assemblage of this period. Other objects included beads, bangle pieces, toy cart wheels, discs, human figurines and sling balls in terracotta; beads of carnelian; bangle pieces of faience; and bone stylus, etc.

A mud wall with wooden posts on the interior side give an idea of building activity of the period for the first time at the site.

Period III having a total deposit of 3.50 m is subdivided into three phases viz.: pre-Kushana, Kushana and post-Kushana. The main feature of the Phase HI A was the use of sun-dried bricks as well as burnt bricks (size: 50 X 24 X 7 cm and 50 X 20 X 7 cm); emergence of red ware and weeding out of the grey and black slipped wares. There is also evidence of use of tiles and introduction of coins, seals, moulded terracotta human figurines, etc. The pottery shapes were bowls, jars, basins, vases, miniature pots and storage'jars, etc. The pottery has stamped designs consisting of *svastika, nandipada,* floral designs, etc. Important antiquities were terracotta sling balls, beads, flesh rubbers, toy-cart wheels, discs, spindle-whorls and a few human and animal figurines. A beautiful figurine of Kubera and a moulded female figurine in terracotta and a seal bearing the legend `*Mulavapinam'* in Brahmi characters of second-first century BC and spindle whorl in copper were the other important finds. Besides, the metallic objects were copper nails and bangle pieces and iron slag, nails and rings. A sizeable number of shell bangle pieces were also found. Bone styli and stone weights are the other notable finds of this period.

The distinguishing feature of Phase III B (Kushana) is the introduction of burnt bricks (size: 37 X 23 X 7 cm) and the copper coins belonging to Kushanas. The total deposit of this period was 4-60 m. A significant structure unearthed was the room of a house having 42 courses and 3-60 m in height. Pottery comprised red ware, having jars of various types, vases, lids, channel-spouted vessels, basins, miniature pots, storage jars, bowls with roundish incurved rim, etc. A few sherds have stamped and applique designs. Large jars with thick brown glazed ware were also found.

Antiquities recovered included Kushana copper coins and a few rings and razor, gold die-struck ring or amulet depicting the head of a moustached male wearing *mukuta;* iron rings, nails, fish-hooks and slag; bone stylus; terracotta shell, ivory and quartz beads; terracotta spindle-whorl, bangle pieces, discs, sling balls, dabbers, toy-cart wheels and animal (bull, horse, elephant) and human (both male and female figurines); pendants of terracotta and shell, bone pins, shell bangles and stone weights, grinding stones and flesh rubber.

Phase III C (post-Kushana) was represented by three structural phases and the antiquities discovered are poor as compared to those of Phase III B. The stamped pottery which continued during Phase III B was absent in this phase.

Most of the structures were built df brickbats.

Period IV (Gupta Period) was encountered at KKT-1 located about 200 m north of KKT-2. The excavation revealed a ruined brick temple of Gupta period. It was overlying a Kushana structure. As the site was badly disturbed, it was not possible to make out the plan of the temple. The size of the bricks

used measure 33 X 22 X 7 cm. Wedge-shaped bricks, corner pillars, petal-shaped bricks, and various types of bricks with floral and geomatrical designs and a few terracotta panels (3 complete and 2 broken) of typical Gupta period with foliage designs were found.

Carved panels (47 X 22 X 7 cm) depicting animals and birds with their hind part shown in foliage were also encountered.

JAMMU AND KASHMIR

36. EXPLORATION IN DISTRICT KATHUA.—In the course of exploration, S.N. Kesarwani and R.N. Kaw of the Srinagar Circle of the Survey discovered the following sites :

Taluk	*Village/Site*	*Nature of remains*
Billawar	Chinji Makwal (32°38'; 75° 22')	Early medieval temple, *baoli* with sculptures and inscription of late medieval period
-do-	Danjasdhar (32°38'; 75°25')	*Baoli* with sculptures and stepped-well of late medieval period
-do-	Dharamkot (32°36'; 75°32')	*Baoli* and sculptures of late medieval period
-do-	Gura Kaliyal (32° 38'; 75° 28')	Temple and sculptures of late medieval period
-do-	Hiranagar Pharngoli (32° 39'; 75° 27')	*Samadhi* of nineteenth century
-do-	Kaug (32°39'; 75°31')	Water tower, temple and tank of late medieval period
-do-	Ramkot (32°38'; 75° 20')	Palatial building, watchtowers, temples and tank of late medieval period
-do-	Thalra-Kaliyal (32°38'; 75°27')	Early medieval site with late medieval fortress, tank and *baoli*
-do	Thethu (32°37'; 75°29')	Sculptures and *baoli* of late medieval period
-do-	Uchapind (32° 39'; 75° 29')	Early medieval sculptures

37. SCIENTIFIC CLEARANCE OF TISSERU STUPA, DISTRICT LEH.—The Srinagar Circle of the Survey under the direction of R.C. Aggarwal, assisted by R.S. Fonia, L. P. Thapliyal, S.N. Kesarwani, A.K. Pandey, A. K. Patel, R.N. Kaw, Balbir Singh and Tsering Wangchuk carried out scientific clearance of the stupa.

The work uncovered 60 X 3.50 X 1 m and 30 X 3.50 X 3.70 m of the lower and upper circular terrace of the stupa respectively. The terrace walls having inward rise were built of rubble stone masonry in mud mortar. There were remnants of plaster over them. Two paws of lion figurine were also exposed on the sinister side of the upper circular terrace. Both the terraces were badly damaged in the centre owing to abnormal thrust of the debris which accumluated on the structures from centuries.

Over the upper circular terrace was a structure having four built-in walls in ascending order with provision of ambulatory passage in between them. Its outermost wall was provided with buttress. The

lower portion of the walls was built of rubble-stone masonry whereas sun-dried mud bricks (10 X 20 X 40 cm) were used in the upper portion.

The third passage on the sinister side revealed a few wooden beams laid over the walls. The floor of this passage was paved with clay and slate stone. All the passages were interconnected with two flights of steps on the second and the third wall. The fourth wall rested on two wall bases having 20 cm gap in between.

Above the walled structure was the drum of the stupa having radiating walls of stone and brick masonry. The drum comprised vault on its periphery and an entrance (1.70 m wide) in the centre with passage and wooden lintels. The square superstructure of the stupa is now survived by a long stone masonry wall on its southern side. Remains of murals and clay votive tablets showing green Tara in *lalitasana,* white Tara, Sakyamuni in *bhumisparsamudra,* Samvara, Mahakala and *chortens* were also found.

38. EXPLORATION IN DISTRICT PULWAMA.—In the course of exploration S.N. Kesarwani of the Srinagar Circle of the Survey discovered the following sites :

Taluk	*Village!Site*	*Nature of remains*
Pulwama	Matarigam (Matigam) (33° 92'; 74°87')	Remains of Brahmanical temple and medieval site
-do-	Muran (33°93'; 74°88')	Siva-/mga datable to ninth-tenth century
-do-	Shadimarg (Shahji Marg) (33°49'; 74°5.20	Remains of Kushana and early medieval period

39. EXPLORATION IN DISTRICT UDHAMPUR.—In the course of exploration, S.N. Kesarwani and R.N. Kaw of the Srinagar Circle of the Survey discovered the following sites :'

Taluk	*Village/Site*	*Nature of remains*
Ramnagar	Balaspur (32°42'; 75° 16')	*Baolis* and sculptures of late medieval period
-do-	Kun (32°39';75°17')	Temple, *samadhi* and *baoli* of late medieval period
-do-	Nagrothal (32°43'; 75°15')	Fortress, temples and tanks of late medieval period
-do-	Pathwara (32° 41'; 75° 14')	*Samadhi*
-do-	Sail (32°40'; 75° 14')	Temple and *baoli* of late medieval period
-do-	Thalore (32°46'; 75°49')	Remains of ancient temple, *baolis* and sculptures of late medieval period

KARNATAKA

40. EXCAVATION AT HAMPI, DISTRICT BELLARY.—In continuation of last year's work *(1985-86,* pp. 37-40), the Hampi National Project of the Survey under the direction of B. Narasimhaiah, assisted by K.P Poonacha, K. Veerabhadra Rao, Hanumanthapa Telugu, M. Loganathan, T.P. Balakrishna Unnithan, J. Rangnath and V.N. Joshi resumed excavation with the view of exposing and resetting the fallen structures to understand the plan of the citadel in the Royal Enclosure and in front of northern entrance to the Mahanavami-dibba in the Royal Enclosure. In addition, excavations were conducted at Hazara Rama and Jaina temple-complexes.

Excavation in the south-western part of the Royal Enclosure revealed a dilapidated and out-of-pluriib earliest inner enclosure wall running almost parallel to the extant outer cyclopian wall. This wall was completely dismantled after proper documentation and reset as per the original (pl. XV) with available stones to a length of 132.4 m (north to south) following the original width of 1 .7 m to a height of 1.5 m. The core of the wall was filled with rubble.

Three more structures (STR 12, 13 and 19) west of STR 11 (exposed earlier) represented by foundation stones only were also encountered in this part of the enclosure. STR 12 and 13 measuring 62-9 X 9.1 m oriented north to south and longitudinally divided into three bays by four rows of pillar and pilaster bases, and STR 19 measuring 27.7 X 15.6 m, oriented east to west and divided into five bays with six rows of pillar and pilaster bases, were probably used as guards' quarters and store. AH the three platforms which were in dilapidated condition were reset as per the original including pillar and pilaster bases.

Excavation in the outer enclosure and the above mentioned inner wall revealed a tank measuring 600 X 6.8 X 4.3 m cut upto the natural rock surface. The tank is lined with dressed stones and provided with a flight of steps on the north. The tank had evidence of plastering. The interesting feature noticed is that a water channel which runs out of the outer wall at the north-western corner runs towards south all along the outer wall and once again enters into the Royal Enclosure to feed this tank located in the south-western corner. The tank was reconditioned and conserved.

In the southern area of the Royal Enclosure, in between the innermost earliest wall and the enclosure wall, a main drain starting from the north-western corner and running towards east measuring 95.7 m in length, 1 -9 m in width and 1 .5 m in depth was noticed. It was probably running out of the Royal Enclosure at the eastern end. This drain is lined with cut-stones wherever necessary and was probably plastered. The bottom is provided with slabs wherever necessary as in some places dressed bedrock itself served the purpose. The beam like stones provided on the top at regular intervals suggest that this drain was covered with slabs. It was also noticed that smaller drains from the Royal Enclosure were connected to this main one. This drain was provided with a silt-trapping chamber for periodical cleaning. This drain was reconditioned as per the original and conserved (pl. XVI).

The open area between south of STR-5 to 12 and innermost and earliest enclosure, yielded, on clearance, innumerable pits following a particular pattern. This evidence suggested that there might have been small trees and flower plants.

Excavation in an area in front of the Mahanavami-d/M?a revealed a tank measuring 24.35 (E-W) X 1390 (N-S) X 1.45 m. This tank (pl. XVII) is unique in the area for its plan and architectural features.

It isT-shaped in plan achieved by pushing the northern and southern sides of the western half internally for 3.48 m on either side. In fact, as per the evidence it was, originally, a square one (13.90 m) which, in the subsequent period, was extended towards cast by 3.25 m and constructed on the west to a length of 360 m as mentioned above, thus extending by 7.20 m. The western tail provided with flight of steps measured 13.90 X 13.55 m. Perhaps this tank was provided with a cloister all around as suggested by the pillar bases. It has an outlet at the bottom and north-eastern corner for depleting water. Though the water channel connecting the tank and the main branch of the aqueduct running north-south is missing due to disturbance it can only be presumed as some pieces of such channel are strewn in this area.

Excavation in the area north-northwest of the *Mabanavami-dibba* but outside the Royal Enclosure revealed a passage between the flight of steps provided to the entrance in the enclosure wall for the Mahanavami-dibba and the palace complex. It is interesting to note that this passage had been provided with make-shift toilets probably with screens. The toilet area has lime plastered flooring and circular basin-like depressions with small circular outlets. This passage, too, was conditioned and the steps provided at the entrance were relaid as per the original (pl. XVIII). An underground water channel from the Royal Enclosure was found across the passage. This was also reconditioned.

The lime concerete water channel between the main stone aqueduct line and the public bath which are protected edifices had fallen into pieces due to the collapse of the supporting wall-like structure over which it was running. This was reconditioned by reconstructing the supporting wall with the available stones and then arranging the blocks of concrete channel salvaged in the excavation (pl. XIX).

It was observed that there was a passage between the southern entrance of the Hazara Rama temple and the entrance in the western wall of the Royal Enclosure. This passage was completely concealed by debris, stones and bushes. This very important passage, probably used by the royal family to visit the Hazara Rama temple, was reconditioned by removing the vegetation and debris and resetting the passage walls by the fallen stones. Incidentally, an underground channel coming out of the Royal Enclosure running into the Hazara Rama temple and feeding a deep tank behind the main shrine was noticed and reconditioned. The southern doorway was also fully exposed and reset.

While clearing the debris, stones and shrubs in front of southern entrance of the Hazara Rama temple, many structures perching over the passage wall were noticed. These structures were built of rubble walls set in mud mortar with a number of rooms. An interesting feature is that one of the rooms had a hearth used for iron smithy. Significantly, the area yielded plenty of caltrops, cannon, mortar, etc. These structures definitely belong to a period when the so -called king Venkatapati I (AD 1586-1614) tried to revive the capital after its destruction in AD 1565.

Excavation in the Hazara Rama temple complex which has been referred to in the foreigners' accounts as main bazar area and wherein all the roads were converging, revealed traces of the well-laid road and structures flanking on either side. Further, a small temple probably dedicated to Siva was exposed. A cyclopean wall running from the arched gateway provided on the road east of Hazara Rama temple, running towards north was exposed. This wall had prominent inclining offsets on the interior which probably served as seats for spectators or visitors. Excavation also revealed that the internal area had been deliberately filled up and impoverished structures of thin rubble stone walls were built over the debris at a much later period.

Excavation in an area of 525 sq. m, in the Jaina temple complex, exposed the ruined Vishnu temple (No. 2). This south facing temple consists of on plan, a *sandhara* sanctum, a rectangular *amarala,* a *mukhamandapa* having entrances on the south, east and west and a sub-shrine in the north-western corner, all enclosed by a high cloistered *prakara* with an entrance tower on the south. Scientific clearance of debris upto a maximum depth of 1 .70 m brought to light the buried *adhishthana* comprising *upana* with *khura* mouldings, *patta-kumuda, kantha* with pilaster designs and a horizontal *pattika* decorated with *kudu* arches. The temple is in a very dilapidated condition needing resetting with the available architectural members.

A large number of architectural members bearing fine carvings were unearthed. As many as six lion balustrades and a sculptured panel depicting elephants and human beings, all from the Royal Enclosure, are noteworthy. Amongst important sculptures mention may be made of six-headed Karttikeya seated on his mount peacock facing front, unearthed near the S i va temple in the Jai na temple-complex, and a few female Saiva deities found near the ruined shrine in the Hazara Rama temple-complex.

Other important antiquities encountered in the excavation are a variety of beads (pl. XX A) of. terracotta and semi-precious stones, iron objects like nails, arrowheads, caltrops (pl. XX B) and a fragmentary cannon (pl. XX C), the caltrops measuring about 5 cm have four sharp spikes which when placed on ground in any manner, one of the spikes will always point upwards. These were strewn in the battle-field to restrict the mobility of the cavalry. The fragmentary cannon unearthed is another noteworthy find. The available specimen (0.49 m long) has two pivots on either side at a distance of 0.71 m from the rear end, perpendicular to the barrel allowing it to move in a vertical plane. Movement in the horizontal plane was achieved by rotating the whole carriage on which the cannon was mounted in the required direction.

A brass plaque bearing the Srivaishnava emblem conch (pl. XX D) discovered during the excavation throws ample light on the contemporary religious practices.

A,gold locket bearing the relief of seated Lakshmi in *repousse,* a weight also in gold in the shape of a small ingot weighing 3-25 gm and a bronze ring with rubies studded on either side of a crystal are amongst the other notable antiquities.

The ceramic industry is represented by the occurrence of plain and decorated medieval black, red and grey wares, few of them having burnished glare. The spout and handles are invariably done by applique method. Deluxe Chinese procelain sherds, some carrying floral designs in blue colour and fragments of delicate, lathe-turned caskets in slate-grey soapstone are amongst the noteworthy finds.

41. EXPLORATION IN BAICHBAL VALLEY, DISTRICT GULBARGA.—In continuation of previous year's *(1984-85,* pp. 30-31) work, K. Paddayya of the Deccan College, Postgraduate and Research Institute, Pune, carried out further exploration in the Baichbal valley. In the course of this work one Acheulian locality (VI) at Agtirth,one Middle Palaeolithic locality at Joganigudda near Hunsgi and one Mesolithic site near Agni were noticed. These are primary sites yielding raw material blocks, finished tools and debitage in an undisturbed context. The Acheulian artefacts were of limestone, and the Middle Palaeolithic and Mesolithic artefacts were of quartzite and whitish chert respectively.

From the detailed geomorphological observations made at a number of Acheulian localities four

distinct stratigraphical contexts were observed (1) at some places it directly overlies weathered or partially-weathered bedrock (granite, schist, etc.); (ii) at some localities it rests on the top surface of kankar conglomerates; (iii) at some places it is spread on the surface of soft brownish clay deposited in a low energy environment; and (iv) at a few localities it is found in association with colluvial wash. In all these cases, the level was originally covered by black soil of variable thickness. On account of various anthropogenic factors including vegetation clearance and agricultural activities the black soil cover has been eroded or deflated away, thereby exposing the cultural material to surface. From the Acheulian localities near Teggihalli, Rampur and Fatehpur a further collection of fossil fauna including dental remains *of Bos* has been made along with the cultural material.

42. EXCAVATION AT SANNATI, DISTRICT GULBARGA.—The excavation at Sannati was taken up jointly by the Hyderabad Circle of the Survey and the Society for South Asian Studies of the British Academy, London. The team consisted of H.N. Singh, J.R.Howell, R.K. Dwivedi, H.S. Gayasuddin, S.V.P. Halkatti, R. R. Hegde, B.A. Bowen, R.S. Kulkarni, A.T. Navali.T.C. Ratnam, and R. V. Siva Sarma.

The north-east quadrant of the Stupa mound was taken up by laying a trench measuring 5 m in width which was dug to a depth of 3 m. The core of the stupa was found to be made up of mud mixed with the limestone fragments to form a more stable basis for the structure. The periphery of the mound revealed evidence of the brick revetting wall which was extending the circumference of stupa at the north-eastern side. Excavation was extended towards the north-western quadrants to trace the above brick structure. The excavation revealed six distinct areas of activity.

(i) Due to the weathering of the stupa mound, the material from the top of the mound gradually slumped down and sealed the stratified deposit around the circumference.

(ii) The north-eastern side of the mound revealed two main structural elements after removing the natural weathered surface. A curved brick wall built-up against the core of the stupa was found running along the north-east quardrant and stopping just short of the northern and eastern cardinal points. The other structure was straight brick wall running approximately from south-east to north-west. The high concentration of tiles in between these two structures was perhaps a roof of a later stage.

(iii) After the removal of the debris ten post-holes meant to support the roof, were found along the southern face of the straight brick wall. An addition of partition wall running north from the drum wall of the stupa has some relation to the post-hole structure. The wall divided the post-hole structures into two sections with an entrance between the rooms. A drain, constructed of limestone slabs was exposed below the partition wall to facilitate the flow of water from east to west.

(iv) The brick drum wall circumference came to an end at the northern cardinal point of the structure but below it to the west was found a revetment wall built of stones. At plain, owing to some disturbances, this stone wall was repaired with bricks. Associated with this brick Avail was a small platform measuring 3.56 X 1.05 X 0.60 m. It was provided with 3 stone steps from the north.

(v) There were series of damaged structures perhaps votive platforms running almost parallel to the drum wall on the north-west of the Stupa.

(vi) The stone revetment-wall was the earliest wall constructed on the mound since the foundations were cut directly into the natural black soil. The wall which had twenty courses of stone work was preserved up to a height of 1 .60 m.

A large quantity of pottery was recovered from the excavations including black-and-rcd ware, red ware, black-polished ware, russet-coated ware and red-polished ware. Other important finds included lead coins of Satavahana rulers.

Other antiquities recovered were beads, bangles, copper alloy and other metal objects.

The excavation of this stupa has established that Sannati was a fortified township of the Satavahana period.

43. EXCAVATION AT NAGARESVARA TEMPLE COMPLEX, HALEBIDU, DISTRICT HASSAN.—In continuation of previous season's work *(1985-86,* p. 43), the Bangalore Circle of the Survey under the direction of B. Narasimhaiah, assisted by B.R. Ramarao, M.N. Vishwanath, G. Krishnamurthy, M.M. Hadpad and B. Mariyappad resumed excavation in mound 1 towards south of temple 2. The excavation revealed the basement of a huge temple (39.60 X 30.75 m) identified as Nagaresvara temple 1, resting on 1 .75 m high *adhishthana* which in turn rests over an *ekapada jagati.* On plan the temple has on its west-to-east axis *agarbhagriha* (3.15 X 2.80m),ananfara/a (3-25 X 2.70m)and a navaranga (98.55 m square) provided with three entrance *mandapas* (2.55 x 2.35 m) on north, south and east. The extent portion in elevation comprises *jagati* and *bhitti.* The extended portion of *jagati* (3.00 m) around the temple serving as *pradakshina,* was found paved with dressed slabs at places. The *jagati* is stellate on plan and has provisions for fixing miniature elephants at cardinal directions.

The mouldings of the *adhishthana* were represented by *pada, adho-kumuda, pattika, tripatta-kumuda* and *urdhva-kumuda.* The *bhitti* of the temple had rows of friezes akin to the other typical Hoysala temples and comprised of (from bottom upwards) *gaja, asva, patralata, makara* and *hamsa talas.*

Further to the east of the Temple 2, excavation revealed a common *mahadvara* (26.00 X 26.00 m) leading to Temples 1,2 and 3. The *mahadvara* (pl. XXI) was also stellate on plan with two symmetrical units intercepted by an east-to-west passage in-between. The passage directly leads to Temple 2. Each unit of *the mahadvara* has on plan a central shrine flanked on either side by a sub-shrine and a verandah in front.

An inscription dated Saka 1151 (corresponding to AD 1229) of Hoysala Narasimha II (AD 1220-1235) unearthed during the excavation refers to the renovation of Jaina temple in the complex. With this in mind, mound 5 to the east of Temple 1 was taken up for probe. It revealed the remnants of a Jaina temple (Temple 5). This on plan consists of a *garbhagriha,* an *antarala,* and a *mahadvara* on its west-to-east axis.

The excavation in this temple complex yielded many loose sculptures and intricately carved architectural members, all belonging to the Hoysala school of art. Among the important sculptures discovered mention may be made of four-handed Vishnu in *samabhanga* (pl. XXII A), six-handed dancing Siva as Kalari (pl. XXII B), eight-handed Siva in *tribhanga,* (pl. XXII C), Dakshinamurti, Nataraja, Uma-Mahesvara, Kaliyamardana Krishna, etc.

The dislodged architectural members found scattered in the excavation belonging to the temples and the *mahadvara* are being re-set in their original position.

44. EXCAVATION AT BANAIIAI.LI, DISTRICT KOLAR.—In continuation of last year's *(1985-86,* pp. 43-44) work, the Bangalore Circle of the Survey, under the direction of B. Narasimhaiah, assisted by C.S.

Scshadri, P.S. Sriraman, G. Krishnamurthy, M.V. Mallikarjuna, resumed excavation at Banahalli with a view to understanding the settlement pattern in each period; to know in detail the disposal of the dead, especially of the people of Neolithic and Chalcolithic cultures; to gather more information about the smelting of iron at the beginning of the Iron Age; and to study the interaction between the protohistoric cultures of this area and the adjoining ones. The excavation was continued in all the seven trenches exposed earlier.

This season's excavation decisively showed that the cultural sequence observed earlier had to be revised as under:

Period I A :	Neolithic cluture represented by layers between 23 and 15 and by about 2 m thick cultural deposit.
Period I B :	Essentially Neolithic but with Chalcolithic traits, represented by layers 14 to 12 and by about 1 m thick cultural deposit.
Period II:	Overlap between Chalcolithic and early Iron age, represented by layer 11 and by about 0.40 m thick cultural deposit.
Period III:	Iron age, represented by layers 10 to 8 and by a 1 m thick cultural deposit.
Period IV:	Early historical, represented by layer 7 to 1 and by a 2 m thick cultural deposit.

In Period I A, the house plans as indicated by the post-holes throughout remained to be circular. The floors are of either a mixture of clay and murrum or of murrum only. The hearths were located outside the hut and contained small pebbles, probably to radiate heat even after the fire was extinguished. There was no evidence of mud plastered red-walls or any such remains, probably indicating that the houses had only poles and thatches.

On the basis of the dimension and the method of construction of the dwellings, two structural phases were identified. Phase 1 is represented by the lower layers in which small houses of 2-5 m diameter were built in groups. The floors of these houses were of two kinds, one purely of rammed clay and the other of heavy pottery pieces rammed with red murrum.

Phase 2 is marked by the construction of large houses of 6 m diameter *(1985-86,* p. 44). These dwellings relatively were well-prepared by using red murrum as the principal construction material. They had a small dwarf-wall of murrum and a well-laid apron of pottery around, for preventing rain-water entering the house.

The handmade ceramic repertoire of this period was very much akin in fabric, shape and treatment to that of the other neolithic sites in south India and characterized by bowls and vessels of burnished and unburnished grey, red and tan wares. A new addition to this standard collection was a solid stand (pl. XXIII A) in coarse red ware, with a tapering profile, having a flat base and a shallow concave top. Interestingly, exactly half of the exterior surface was decorated with incised decoration while the other half is plain.

The lithic industries had two components comprising a pecked and ground stone industry (pl. XXIV A, a) and microlithic industry (pl. XXIV A, b). Axes, adzes, dabbers, rubbers and burnishers made of basalt and granite are the major types of the former whereas the latter industry is dominated by blades, lunates, flakes and fluted cores of quartz and chert. It was observed that the frequency of incidence of microliths was increasing from lower layers towards upper layers of the period only to

diminish abruptly in the subsquent Period IB. A good number of saddle querns of granite adds up to the stone antiquities. A bone industry (pl. XXIV A, c) comprising of points made out of splinter bones was also obtained from this period.

Period IB, essentially neolithic but with chalcolithic traits, is mainly distinguished from the previous period by the introduction of vertical urn burials within the habitation (pl. XXIII B). Copper was also introduced in a meagre quantity. An important change in pottery making was the introduction of fast wheel and inverted firing technique.

One of the distinctive features of this period is the introduction of vertical urn-burials. Two burials of this kind were exposed. One of the urns buried vertically in a pit contained only the skeletal remains of an infant (?) and was closed with a shallow bowl. The highly burnished pinkish grey urn is a globular pot with flaring rim. The other burial also contained the skeletal remains of a child, vertebral column, and the longer bones of hands and legs. The urn filled with earth and murrum lumps was probably closed by a shallow bowl (found broken inside the urn). This handmade urn, in coarse fabric is a big jar of drab-coloured ware with an out-turned flaring rim and elongated body with a narrow rounded base. The first burial is primary while the latter is of secondary nature.

During this period, smaller circular houses of approximately 2.50 m diameter were built in clusters as reported earlier, where the large circular house of the previous period was existing. These structures were marked by well-rammed red murrum floors with post-holes circumscribing it. Within this cluster, an odd house with a semi-circular plan marked with stones was also exposed. This house also had post-holes and well-rammed floor.

A solitary copper parer (pl. XXIV A, d) with a broad working edge, short stem and an ovalish head was obtained from this period. Microlithic industry is poorly represented by 34 percent of the total tools obtained in this year's excavation. Bone tools, accounting for 13 percent of the total assemblage, are similar in all respects to that of the preceding period. It is, therefore, evident that microlithic and bone industries which dominated the earlier period had now lost their relevance, but were carried over as cultural trait.

Pottery repertoire is esentially like that of the preceding period; however, introduction of techniques like inverted firing and use of fast wheel were also attested increasingly in the assemblage. Decoration on the pottery is similar but notable is a sherd with punctured designs of a bull and a camel (?). Significantly characteristic painted sherds were absent in this period.

Period II (overlap between chalcolithic and early iron age) is characterized by a strong influence, of megalithism over an essentially chalcolithic assemblage as for example, the occurrence of extended inhumation of the dead invariably with stone appendage within the habitation (pl. XXIV B). The burials were also provided with black-and-red ware bowls as grave furniture. This influence is further manifested in increased percentage of black-and-red ware, black ware etc., in the pottery assemblage. However, the burial pottery except for the bowls of black-and-red ware, is handmade, burnished and very much akin to the traditions of Period I in all respects. Iron also makes its appearance in a small way. Painted pottery, another characteristic tradition of this period elsewhere, is conspicuous by its presence in an insignificant quantity.

Altogether, four burials were exhumed during this season, three of which are of adults and fourth one is of a juvenile. The burials are oriented invariably north-south with head towards north. All the burials were primary except for one, which is secondary. The skeletons were full and almost intact with

no limbs chopped off, and were laid in supine posture. The burial pits are ovalish in shape and are shallow. The pit floor was not prepared and it was filled up with the same earth. The grave furniture included microliths in two instances, bead in one instance and pottery in all. Stone appendage was invariably given after the burial was over and the pit was filled, either by closing the pit by dressed or undressed slabs or by cairn packing. Besides the above four burials, symbolic burials represented only by pottery and stone appendage were also exposed.

The interesting feature of this period is that only burials yielded microliths made on chert and quartz, but the blades are made on chert. However, outstanding is the occurrence of three fragmentary composite tools (pl. XXIIIC) in one of the burials. These tools have a bone haft which is a piece of semi-hollow bone. On the curved side of the bone, the blades were set in row in grooves with intervening space. The groove was slightly widened at one end to accommodate the bulb of percussion. A sort of bindng material seems to have been used to fix the blades. It was observed that three such blades made a complete tool as suggested by three grooves in a specimen.

A most important feature of the settlement of this period was the location of burials within the habitation. The burials were all laid out in a row, but widely separated. A plan of circular house was located adjacent to the burials of the juvenile. No other structural remains could be exposed.

Period III yielded typical Iron Age assemblage of black-and-red ware, black ware together with copius presence of iron implements. An interesting feature of this period is the local production of iron as witnessed by an iron smelting area which is complete with all necessary facilities.

This area had altogether six furnaces of which three were located in a row and others were dispersed. The entire area around these furnaces was covered with a thick layer of solidified iron slag suggesting an intensive iron smelting activity. The furnaces were similar in plan and elevation. They are all single chambered, except one, provided with or without a tuyere for passing air. To construct these furnaces a circular or ovalish pit of about 15 cm was scooped below the working level. Except two furnaces, all were internally plastered with red murrain. Furnace (FI) was different in plan as it had two interconnected chambers and probably this was the only furnace with traceable evidence of superstructure. One of the furnaces (F3) closely resembles the modern ovens of the blacksmiths used for heating the iron red-hot. Two anvils of granite stone were aiso found near the furnaces. And also, it was found that iron ore pebbles were stacked near them. The exact method of operation of these furnaces is being worked out. Associated to this area plan of a small circular house was also traced.

The iron antiquities (pl. XXIV A, e) of this period conform to the well defined typology of arrowhead, blades of dagger, hook, nails, spearhead and sickle. A close examination of the objects revealed that they were made by forging.

A spurt in bead-making was evidenced during this period. Diverse material and shapes came in vogue. Notable among the raw materials used were glass, terracotta, carnelian and coral. Etched bead of carnelian in the disc-cylinder-circular shape with short radial lines etched in white along the circumference was a sepciality of this period. A good collection of plant remains that were collected during the course of excavation are yet to be analyzed. The excavation, for the first time, established sequence of culture of this region and also gave glimpses of settlement pattern of true neolithic period and of the subsequent periods. No evidence of disposal of the dead was encountered in the true Neolithic levels. The overlap of the chalcolithic and the iron age cultures was identified in this region for the first time.

KERALA

45. EXCAVATION AT FORT COCHIN, COCHIN, DISTRICT ERNAKULAM.—The Madras Circle of the Survey under the direction of K.P. Poonacha and T. Satyamurthy, assisted by G.S. Narasimhan, T.P. Palani and Vinayagam, undertook trial excavation of an underground tunnel passage located opposite to the RDO Office at Fort Cochin. The site approximately measures 70 m (east-west) X40 m (north-south) and is enclosed by a high enclosure wall. There are some buildings said to have been built during the British period.

The excavation revealed a brick-built covered passage running in north-south direction. Incidentally, the spot where digging had been carried out earlier was a junction, as two more passages running in east and west directions were found connected to it. This is indicated by the remains of two more narrow channels and two more disturbed openings of the passages in the adjacent quadrants. The northern and southern passages measure 7.75 rri and 7.20 m in length respectively and are provided with a narrow channel 0.35 m deep and 0.15 m wide in the middle, which was perhaps a watertract. The bricks are laid with a special mortar made of shell and lime. It is interesting to note that the north and south passages end abruptly with a dome-shaped ceiling and a conical pit, built of bricks. The interior width of the passage measures 0-68 m while the thickness of the walls vary from 0-20 m to 0-30 m and the height of the passage varies from 1.75 m to 1.35 m.

Excavation on the western side where a narrow channel and the opening had been noticed revealed another covered passage, with a disturbed arched entrance. Towards the western end, a flight of six lime-plastered steps leading to the ground was exposed. Each step measures 0.75 m in length and 0.25 m in width. Three steps in the interior of this passage, unlike others, were partially plastered with lime shell mortar and provided with a semi-circular niche on the northern wall. The antiquities encountered included terracotta lamps and porcelain ware, the latter having Portuguese marking.

MADHYAPRADESH

46. EXPLORATION IN DISTRICT BALAGHAT.—Under the problem-oriented survey scheme, S.N. Raghunath of the Bhopal Circle of the Survey discovered several late stone age sites near Balaghat, Baihar, Dongerbhed, Lohana and Mani Tilla.

47. EXCAVATION AT KHAJURAHO, DISTRICT CHATTARPUR.—In continuation of previous year's *(1985-86,* p. 48) work, the Bhopal Circle of the Survey under the guidance of H.K. Narain assisted by G.T. Shende, Phani Kant Mishra, J.K. Patnaik, Y.D. Sharma, Jagdish Prasad, R.K. Shrivastava, D.K. Kasbi and Abdul Saleem carried out excavation at KJH-1 with a view to ascertaining the extension of the brick platform and brick structure.

Excavation confirmed that the stone structure discovered in this season and in the previous season belonged to Pratihara period. The brick structure has superimposition of Period I, II and III. The excavation revealed a brick structure in the eastern opening. The general measurement of the bricks

were 40 X 25 X 8 cm. Another interesting find was lime coated pilasters on the upper northern wall of this trench.

The brick platform was rectangular in shape and had been altered and disturbed at places. The important finds of the late level of period II consist of beads, terracotta pendants, figurines possibly of bull, gamesman, discs, pierced and unpierced, spools and stone beads. The iron objects found from KJH-II included twenty -six shapeless and indeterminate lumps, tanged arrowheads, fragmentary blade of dagger, leaf-shaped spearhead, nail and fragmentary bangle of roundish section.

48. EXPLORATION IN DISTRICT DHAR.—In continuation of last year's *(1985-86,* pp. 48-50) work, J.K. Patnaik of the Bhopal Circle of the Survey explored 103 villages in the Districtrthe sites where antiquarian remains were noticed are as under

Telisil	*Village/Site*	*Nature of remains*
Manawar	Badiyar	Ruins of Siva temple
-do-	Bhauriya	Mound
-do-	Bhilsur	Images assignable to the Paramara period
-do-	Birampura	Microliths
-do-	Chitri	Mosque
-do-	Doi	Mound and ruined Siva temple
-do-	Hatnawad	Mound with chalcolithic remains
-do-	Itawad	Early historical sites
-do-	Jamnia	Early medieval mound
-do-	Kalibaodi	Medieval *baoli*
-do-	Kothara	Medieval well
-do-	Kukshi	Remains of *garhi*
-do-	Kushdena	Ruins of temple of Pratihara period
-do-	Lalgarh	Microliths and medieval watch-tower
-do-	Lunera	Ruined Siva temple assignable to ninth century
-do-		and monolithic image of Ganesa
-do-	Lungsiri	Black-and-red ware and a ruined Vaishnava tem-
-do-		ple of Pratihara period
-do-	Mahapura	Pottery, microliths and an early medieval Siva
-do-		temple
-do-	Naingaon	Rock-shelter
-do-	Nimbolda	Medieval well
-do-	Padharina	Late medieval well
-do-	Pagaran	Mound and Siva and Jaina temples
-do-	Patalabad	Well containing Brahmanical images
-do-	Perwi	Ruined Paramara temple

Telisil	*VillagelSite*	*Nature of remains*
Manawar	Pipalda	Siva temple assignable to Paramara period
-do-	Raisenpura	Rock-cut caves
-do-	Rampura	Microliths
-do-	Ronda	Ancient mound
-do-	Salan	Microliths
-do-	Sulgaon	Mound with chalcolithic remains
-do-	Sundrel	Devi temple with loose sculpture assignable to eleventh century
-do-	Susaria	Sculptures and medieval fort
-do-	Talwara	Ruins of a Siva temple assignable to Paramara period
-do-	Thobati	Siva temple of Paramara period

49. EXPLORATION IN DISTRICT GWALIOR.—The Department of Ancient Indian History, Culture and Archaeology, Jiwaji University, Gwalior, under R.P. Pandey and R.A. Sharma assisted by Harbax and under the overall direction of R.N. Misra, carried out exploration specially on the Morar, Sankh, Suvarnarekha and Vaisuli and its tributaries in the middle Chambal system.The explorations revealed a continuous cultural sequence right from the Lower Palaeolithic toMesolithic besides bringing to light painted rock shelters.

The Lower Palaeolithic sites were located at Kaimari, Panihar and Sirsa on the tributaries of Sankh and Suvamarekha rivers. The tools made up of quartzite were picked up from the dried-up beds. The tool-kit consisted of handaxe-cleaver group. A Middle Palaeolithic site was located at low-lying hills near Naugaon village on the Morar river. The tools were fashioned on various coloured chert and allied materials. These tools represent flake industry of scraper-borer complex.

The Upper Palaeolithic was the richest industry. Fourteen sites came to light for the first time in the area namely Panihar, Girvai Naka, Gokulpura, Kedarpura (at two locations), Shalupura, Colonypura (at 3 locations), Mohanpur, Boa Sahab-ke-pura, Sonsa, Utila, Gum, Vicky factory site, Sithauli and Jorasi-ki-Ghati. The Upper Palaeolithic industry encountered at these sites was of blade-burin character and tools were made on silicious group of minerals.

The Mesolithic sites were identified at five places namely Bhirkuli, Bhattan-ka-pura, Jhandupura, Putalighar and Baijnath Chhaj. These sites are situated on the Sankh and Morar rivers. These sites except Bhattan-ka-pura are located on the top or on slope and foot of the hills while Bhattan-ka-pura is on the elevated land. The industry represents the cruder variety fashioned on the silicious group of minerals and is devoid of geometric forms, thus representing the early stage of mesolithic industry.

Besides, a number of rock-shelters were also discovered in the area and many of them preserve early rock paintings on the walls and ceilings. Such rock-shelters were discovered at Dengaon Churel Chhaj, Para, Bala Chhaj and Sia Bhat. The paintings are in red ochre and black colours. On the basis of style they seem to range from the Mesolithic to the historical periods, and consists of human and

animal figures, chariot, bullock-can, dancing and ceremonial scenes. The rock shelters at Maharajpura and Sia Bhat also yielded Mesolithic tools which were collected both from inside and outside the shelters.

50. EXCAVATION AT SOORON, DISTRICT GWALIOR.—R. A. Sharma and R.P. Paridey under the general direction of R.N. Misra of the School of Studies in Ancient Indian History, Culture and Archaeology, Jiwaji University, Gwalior, conducted excavations at Sooron. The main aim of the excavation was to confirm last season's results. Digging was started initially in an area of 15 x 15 m towards north. No stratified material was encountered in this trench except for two large pits, one on the north-eastern corner and. the other on south-western corner which contained potshreds in plenty besides minor antiquities and animal bones. The pottery here consisted of red, black, grey and black-slipped wares which were all found mixed together. The pottery types include vases, dish, bowl, *liandi,* lipped bowl, storage jars, inkpot lids and sprinklers. The pottery recovered from pits was comparable to that found in previous season's work in SRN 2 and accordingly it could be placed between 700 BC and AD 300. The pit material also included a pottery piece with a perforated kjiob.

The pits in SRN-3, towards the south of the mound yielded some antiquities consisting of iron and copper objects like nails and other pieces and terracotta human and animal figurines, beads, balls, wheels and flesh rubbers. Bangles of ivory and bones, beads of semi-precious stones were also encountered. Chronologically, the material as well as the pottery relate to the period from 700 BC to AD 300 but all this material was found mixed together in the pits.

In sum, this season's excavation has helped in delimiting the size of early historical settlement towards the centre of the mound, eliminating the possibility of its extension towards the periphery of the mound on southern side.

51. EXPLORATION IN DISTRICT HOSHANGABAD.—In the course of survey of antiquarian remains in the area coming under the Narmada Valley submergence of Indira Sarovar Dam, Phanikant Mishra of the Bhopal Circle of the Survey explored the following sites :

Tehsil	*Village!site*	*Nature of remains*
Harda	Jania	Mound
-do-	Bimangaon	Brick temple and mound
-do-	Dhanwada	Medieval temple ruins
-do-	Gayat	Brahmanical sculptures
-do-	Golan	Medieval sculptures
-do-	Hirapur	Brahmanical sculptures
-do-	Malpoli	Remains of fort wall and temple
-do-	Neemkhedi	Brahmanical sculpture
-do-	Saktia	-do-
-do-	Siralia	Siva temple
-do-	Surjana	Mound

52. EXPLORATION AND EXCAVATION IN DISTRICTS HOSIIANGABAD AND NARSINGPUR.—In continuation of last year's work *(1985-86,* pp. 50-53), V.N. Misra, S.N. Rajaguru, G.L. Badam, R.K. Ganjoo, S.B. Ota and L.K. Mishra of the Deccan College, Post-graduate and Research Institute, Punc, carried out further exploration in the valleys of central Narmada and its tributaries and conducted small-scale excavations at Guarighat and Samnapur.

A reconnaissance survey was carried out along the Vindhyan foothills on the northern bank of the Narmada between the villages Gokula and Pithera for locating new archaeological sites. The distance between the river Narmada and the foothill ranges from 0.5 to 30 km in this area. The Narmada alluvium which forms a distinct and continuous high terrace is highly dissected forming a bedland topography. At the foot of a hill about 1.5 km north-west of village Samnapur (23°06' 17"; 79°07' 30"), stone artefacts were seen eroding out of the topmost unit, the yellowish silty clay of the alluvium in large numbers. The artefacts mostly comprise of large flakes made mainly on yellowish cherty quartzite and some on Vindhyan quartzite. The artefacts are in a remarkably fresh condition.

In the course of exploration, a Mesolithic site was located on the Vindhyan outcrop overlooking the northern bank of the Narmada about 200 m east of the cascade and 2 km west of Kerpani village (23°04'37"; 79°09'30"). The distribution of artefacts on the uneven and rocky slope suggests that they were originally located on the surface of the alluvium and have dropped down on the rocky surface due to the alluvial deposit having been washed away by rain water. The artefact assemblage comprises microblades, blunted back blades, crescents, triangles and fluted cores, all made on quartz and chert, and choppers made on Vindhyan quartzite. One fragmentary ring-stone was also found on the site. The location of the site close to a perennial water pool in the river suggests that aquatic resources may have been a major attraction for the makers of this assemblage.

In palaeontological exploration at Hathnora in district Hoshangabad, fossil bones (numbering about 30) of *Bos namadicus antilope* sp., *Trionyx* were discovered in basal pebbly sandy conglomerate from which a hominid fossil was recovered by the Geological Survey of India in 1982. Along with fossil bones, flake tools (scrapers etc.) on chalcedony were found. These tools were unrolled and may be classified as Middle Palaeolithic.

On the left bank of the river Shakkar, near the railway bridge at Gadarwara heavily mineralised fossil bones of *Bos* sp. and *Hippopotamus* were found in a basal well-cemented pebbly sandy gravel which is interlayering with 'Red Clay'. Fossil bones collected from the site, 0.5 m above the modern water level are semi-rolled. A well-preserved lower jaw *of Bos namadicus* and around twenty fresh to rolled Middle Palaeolithic tools were recovered from a yellow brown *kankary* silt at a height of about 20-25 m above the bed of the river Sher. The silty formation was found to rest on pebbly conglomerate.

In order to find the exact stratigraphic position of the artefacts and the nature of their distribution at Samnapur, a small excavation in an area of 4 x 4 m was carried out on the spot from where the tools were eroding. Aftefacts were found throughout the excavated deposit and though they occurred in all squares, their distribution was uneven. There was a higher concentration between 15 cm-25 cm and 35 cm-40 cm depths. A large number of pebbles and cobbles with an average diameter of 15 cm were found distributed throughout the trench. These were obviously brought to the site to provide a stable flooring and raw material for artefacts.

The assemblage from the excavation comprises end flakes (168), side flakes (30), indeterminate flakes (32), blades (8), side scrapers (11), end scrapers (4), knives (3), denticulate (1), cleaver (1), cores (44) and worked nodules (43). The artefacts are in a remarkably fresh state of preservation. This aspect together with their geological context of fine clayey silt in which the artefacts are buried clearly establish the primary context nature of the site.

The palaeolithic human groups camped on the top of the high alluvial terrace at the foot of the hill. However, the cover of clayey silt over the palaeolithic occupation indicates that subsequent to the occupation, the site was inundated by river water. The absence of bifaces and the predominance of flakes suggest that the occupation is of post-Acheulian age. The absence of core tools and bifaces, large size of flakes, low frequency of retouched tools and very low frequency of blades all preclude the assemblage being Lower or Upper Palaeolithic. It can therefore only be classified as Middle Palaeolithic.

In continuation of last year's work at Guarighat *(1985-86,* pp. 50-53), two more trenches were dug in the sandy silty facies of the Upper Group of the central Narmada Valley at Guarighat (23°0'30"; 79°06'30"), on the right bank of river Sher. The first trench, GGTI was dug in sandy silty unit at a height of about 10 m above the modern bed level of the Sher. The depth reached in this trench was 8 m. About 125 m south of GGT I another trench (GGT II) was dug to a depth of 17 m from the top at a height of about 25 m above the modern bed level. The stratigraphy as exposed in these two trenches is as follows (from top to bottom):

S.No.	*Lithological unit*	*Thickness*	*Faunal & cultural material*	*Remarks*
		GUARIGIIAT 1		
1.	Well cemented pebbly sandy gravel grades to	10 m	—	Channel bar
2.	Reddish brown clay interlayering with weak pedogenesis grades to	2-5 m	—	Near channel over bank with sub-aerial exposure
3.	Well sorted and laminated greyish sand grades to	1-75 m	*Trionyx* sp. scrapers (Middle Palaeolithic period)	Consistent flow regime with moderate water depth
4.	Reddish brown clay grades to	1-25 m	*Bos* sp. with rolled flakes (Middle Palaeolithic tools)	Interchannel or near channel low energy conditions

SJVo.	Lithologi'cal unit	Thickness	Faunal & cultural material	Remarks
5.	Pebbly sandy gravel conspicuously limonitised	1-50 m	Gastropods	Channel bar
		GUARIGIIAT II		
1.	Pebbly sandy gravel moderately cemented, at times well laminated and slightly imbricated with sharp contact	4-75,m	*Sus* sp. (Middle Palaeolithic tools (5)	Channel bar with consistency of water flow
2.	Dark brown fissured clay rich in organic material grades to	2-50 m	*Trionyx Hippopotamus sp.*	Channel pool
3.	Sandy pebbly gravel, moderately cemented well sorted, laminated and at times coated by iron and manganese oxide sharp contact to	2-75 m	—	Channel bar with a fluctuating water depth
4.	Brownish fissured clay with conspicuous pedal crumps, slightly mottled, free of *kankars* grades to	45 cm	*Bos* sp.	Interchannel pool
5.	Sandy pebbly gravel, moderately cemented with lenticular patches of brownish clay with pedogenic *kankar* nodules (6-8 cm thick) sharp contact to	80 cm		Fissured clay with *kankar* nodules; represents palaeolosol development, indicating shifting of the channel
6.	Brownish fissured clay grades to	30 cm		Pool

S.No.	*Lithological unit*	*Thickness*	*Faunal & cultural material*	*Remarks*
7	Weakly laminated coarse sand grade to	1.0m		Point bar
8	Brownish clay with a sharp contact with	25 cm		Pool
9.	Sandy pebbly gravel moderately cemented sharp contact with	20 m	*Equs nomadic us,* Bos *namadicus,* Antilope sp.with Middle Palaeolithic tools viz. flakes and scrapers (10 slightly rolled), Gastropods and Lamellibranch shells	Channel bar
10	Fissured clay	—	—	Pool

Lithological character of various fades exposed in both the trenches at Guarighat show that sediments have been laid down in a channel, inter-channel pool and near channel overbank environment. Presence of weak to moderately developed palaeosols within pool clays indicated that the bed of the Narmada was completely dry for some period, probably either due to lowering of water table or to considerably lateral shifting of the river.

Majority of the Middle Palaeolithic tools are semi-rolled to rolled thereby suggestive of their secondary context within the sediment. On the other hand about 15% of the total number of fossils are with fresh unabraded surface. Complete fossil bones and intact teeth account for 20% and the rest 65% fossils are incomplete or fragmentary. These represent different stage of rolling' and transportation. Several breakage patterns, flaking and evidence of bacterial action and/or chewing are preserved on the fossil bones.

The excavation pit taken for the foundation of the bridge connecting Devakachar village with Umria was examined. A gravel bed at 7-5 m below the present bed level of the river was observed. The gravel was conformably capped with red clay, one of the oldest exposed litho units in the central Narmada Valley. A slightly rolled bifacially worked flake on chalcedony, which appears to be one of the earliest (Middle Pleistocene?) tools discovered in a stratified context was collected along with a highy mineralised piece of fossil wood.

53. EXCAVATION AT HIRAPUR KHADAN, DISTRICT HOSHANGABAD.—In continuation of the earlier work (*1974-75,* pp. 22-24), the Prehistory Branch of the Survey under B.P. Bopardikar, assisted by S.S. Gupta, N.G. Nikoshey, A.J. Nambhiraju, J.S. Dubey, R.K. Dwivedi, K.M. Girhe, N.K. Nimje, Mala

Ukey, P.S. Pashine and C.L. Yadev conducted excavation of an Early Stone Age site at Hirapur Khadan with a view to ascertaining the occupational horizons of various stone age cultural phase with their stratigraphical context.

The surrounding area revealed remnants of denuded forest cover with outcrops of quartzite and sandstone. There existed a perennial natural lake on the western side about 0-8 km from the present site. The important geomorphological features of the site is the preservation of various Pleistocene formations. The remnants of the primary laterite can be seen in patches at higher levels. The thick deposit of detrital laterite is on the slopes of the hill filling pockets and uneven surface in the joints of the bedrock. The detrital laterite is sterile with an unconformity overlain by a very thick colluvial deposit with large number of angular blocks of quartzite mixed in red clay matrix. Due to the close contact with the feruginous material present in detrital laterite, the clay matrix overlain this at the bottom horizon of this colluvial deposit has turned reddish in colour and the associated quartzite blocks are comparatively more weathered than the upper horizon of the deposit. The clay matrix in upper horizon has turned into brownish clay. All these successive deposits can be observed on the quarried section at the site, which were later on confirmed in the excavated trenches.

Altogether six trenches (I to VI, measuring 3 X3 m, 3 X 3 m, 1.50 X 10 m, 1.50 X 1.50 m respectively) were taken at various levels at the site to ascertain the vertical and horizontal extension of various cultural phases and their stratigraphical position. The maximum and minimum cultural deposit encountered in the trenches is about 2.20 m and 0.35 m respectively. Among the excavated trenches, Trench I has revealed an excellent evidence of Acheulian phase more or less in its primary context. The total thickness of the cultural deposit in the trench is 2.20 m associated with the colluvial deposit resting over unconformably on detrital laterite. This trench has also yielded the evidence of microlithic industry confirmed to the top 35 cm. It is interesting to note that the degree of weathering of Acheulian artefacts varies from highly weathered to fresh ones from bottom to top respectively, suggesting a long duration of Acheulian occupation. This observation is also supported on the basis of the preliminary study of the Acheulian asemblage, which shows an evolutionary typo-technological succession from early to late phase of Acheulian culture.

Trenches II and III were taken slightly at a higher level which have yielded a cultural deposit of 0.80 m and 0.35 m respectively. These trenches have yielded the evidence of Middle and Late Stone Age industry. The talus material or the colluvium with which the Middle Palaeolithic industry is associated is comparatively loose and less thick than the deposit encountered in Trench I and it overlies the weathered bedrock. From the general nature of the deposit, it may be possible to equate the present stratigraphic horizon with the last phase or layer 2 of the colluvial deposit represented in Trench I. Late Stone Age industry is confined to the top horizon upto a depth of 0.35 and 0.25 m in both the trenches.

Trench IV was laid at a level lower than the previous three trenches. The stratigraphic horizon represented in the trench comprises 0-50 m thick colluvium over which rests 0.70 m thick deposit of black soil. As the trench is at a lower level on the slope, there is every possibility of the redeposition of sediments coming from a higher level. This is supported by the evidence of the occurrence of a redeposited assmeblage associated with the Trench V and VI, which are still at a lower level yielding the same stratigraphy and in context of artefacts like that of Trench IV.

In general, the artefactual evidences from various palaeolithic cultural phases are interesting at the site, as it shows acontinuous linear typo-technological developmental succession from early Acheulian to Middle Palaeolithic. The tentative division of two evolutionary phases, i.e. early and late phase within Acheulian culture (pl. XXV A) at the site have been recognized on the basis of both composition of assemblage, technological development and refinement of the artefacts. The early Acheulian industry is characterized by the occurrence of comparatively more number of bifacial choppers and handaxes, and less cleavers, scrapers, points, etc., than the late Acheulian. The late Acheulian artefacts are comparatively smaller in size, more symmetrical in shape with increased number of flake scars, absence of cortex, reduction in thickness than the early Acheulian. Raw material used for fabricating the Acheulian artefacts is mostly quartzite blocks available at the site. Apart from this, a few chert artefacts comprise the Acheulian assemblage.

The Middle Palaeolithic industry (pl. XXV B) at the site is characterized by the occurrence of scrapers, points, borers, etc. Raw material used for fashioning tools are mostly quartzite and a few cherty material available at the site. The microlithic (Mesolithic) assemblage which is the last cultural phase ai the site occur extensively on the surface. The assemblage constitutes both simple and finished artefacts viz. blades, flakes, fluted cores, and flake cores, whereas finished artefacts comprise varieties of scrapers, points, lunates, obliquely retouched blades, backed blades, etc. Chert and chalcedony were used as the major raw material, a few are made of quartzite.

54. EXPLORATION IN DISTRICT KIIANDWA.—In the course of village-to-village survey, Phanikant Mishra of the Bhopal Circle of the Survey explored the following sites of archaeological interest:

Tehsil	*Village*	*Nature of remains*
Harsud	Anjania	Mound
-do-	Balri	Siva temple of Paramara period
-do-	Barkeshwar	*Garhi* of medieval period
-do-	Dantha	Late medieval *baoli*
-do-	Gehugaon	Brahmanical sculptures and fort wall
-do-	Gunnor	Fort wall and ruined temple
-do-	Jaitapur	Well of late medieval period
-do-	Jasgaon	Medieval architectural fragments
-do-	Nandama	*Garhi* and a ruined Siva temple

55. EXCAVATION AT MAIHAR-I, DISTRICT SATNA.—The Department of Ancient Indian History, Culture and Archaeology, University of Allahabad, under the direction of J.N. Pandey and J.N. Pal assisted by D.K. Shukla, M.C. Gupta, H.N. Kar and Rajendra Prasad carried out the excavation at Maihar (24° 16'; 80°46') with a view to exposing the Acheulian horizon.

The areas-selected for excavation has been designated as Maihar-I (MHR-I) and is located almost in the middle of foothill of Sharda temple hillock and the Lilji *nadi,* a perennial tributary of the Tons river. This area is a flat land having gentle slope from south to north and west to east. On the northern side there is a *nala* which has cut the deposits and also the shale formation. Artefacts arc found on both the sides of this *nala* either completely exposed or buried in yellowish soil, on the underlying shale formation. On the top sufrace there are sporadic scatters of microliths which include blades, flakes and cores and their fragments made on chert and chalcedony.

A trial trench (1 X 1 m), taken up for excavation to the south-west corner of grided area in order to know the stratigraphy indicated a deposit of 112 m, divisible into 3 layers, of which the layer (1) yielded a few fragmentary chert blades, layers 2 and 3 did not yield any artefacts but the next layer i.e. 3 A yielded Acheulian tools. Anvils and hammer stones were found alongwith different sizes of cores and flakes and finished tools.

The tool types include mainly cleavers, handaxes, scrapers, knives, polyhydron, choppers, etc. Cleavers are more numerous than the handaxes. All cleavers and most of the handaxes are made on large flakes. The edge damaged and broken tools indicate their use at the site itself. The artefacts are remarkably fresh and show no water transport.

56. EXCAVATIONS AT NADNER, DISTRICT SEHORE.—The Prachya Niketan, Centre of Advanced Studies in Indology and Museology, Bhopal, affiliated to Bhopal University, Bhopal, under the guidance of C.B. Trivedi, Professor and Head of the Institute with the assistance of Sudhakar Nath Mishra, Curator, Birla Museum and Ramesh Chandra Yadav, Research Scholar, resumed excavation at Nadner. The purpose of the excavation was to unfold cultural sequence and to impart field training to students.

Two trenches, within the fortified area, in the centre of the mound near the subterranean temple and the second on the western fringe of the mound, were taken up for excavation. The excavation at NDR-1 revealed fourfold cultural sequence.

Period I (Mesolithic) is characterized by tools comprising scrapers, bifacial points, borers, parallel blades, blunted blades and a large number of flake tools. A number of semi-fossilized bones of *Bos indicus* and other animals have been found on the upper gravel on the bank of the Narmada. The industry marks the transitional phase from the Upper Palaeolithic to the Mesolithic stage.

Period II *(circa* 700 BC to 500 BC), rests on natural soil, is marked by the presence of plumred ware, chocolate slipped pottery with oblique incised designs, black-and-red, black-slipped and vesiculated wares. The types are long-necked jars, *lota,* bowls, dishes, *handis,* storage jars and a black and red miniature pot.

Among antiquities, mention may be made of copper bells and ear- rings, terracotta beads and discs, iron sickles, arrowheads and crucibles, and shell bangles. Traces of mud-walls,were found but due to limited area of excavations no complete house plans could be obtained.

Period III A *(circa* 500 BC to 400 BC) is marked by the presence of deluxe monochrome NBP ware, a sherd inscribed with Ujjain symbol along with associated wares. Black-slipped, black and red and plum coloured wares of the preceding period continued during this period as well.

This period is marked by intensive building activity which include rammed floor of brickbats, roof tiles, foundations of cobbles, *kankars* mixed with compact black earth and walls of wattle-and-daub.

The finds of the period include copper amulets, finger-rings, glass, shell bangle pieces, beads, miniature stone balls, terracotta wheel and whorls.

Period III B *{circa* 400 BC to 300 BC) is marked by the presence of punch-marked coins, NBP ware of various hues and associated wares of previous periods. Main types are *lota,* lids, inkpots, bowls, dishes and *handi.*

Among the antiquities mention may be made of beads of semi-precious stones, micro-beads, and a soapstone figurine of lion (4 cm) seated on its haunches on an abacus with grotesque-faced *kirtimukha* flanked by geese. Other important finds are a piece *of suchi* of a *harmika* of polished red sandstone; iron chisels, nails, sickles, large spoons, arrow-heads, slags; lead rods; antimony rods; terracotta cart-wheels; stone-legged querns, pestles, flesh rubbers with interesting designs; and copper amulets and bells.

Dietary habits are represented by fish and charred animal bones.

Among important structures mention may be made of ring wells, a brick drain with four courses with headers and stretchers (brick size: 49 x 23 x 07 cm), having a soling of river pebbles and *kankars* mixed with roof tiles, brickbats, and river *kankars;* the walls are built of bricks measuring 51 x2-5xO-7 cm. The end of this period is marked by large-scale conflagration over which the structures with consolidated foundation were erected.

Period IV (300 BC to 200 BC) is dominated by drab red ware and micaceous red ware but the NBP and punch-marked coins continued during this period. The types are *handis,* bowls with sharpened rims, ribbed black-slipped bowl and dishes of poor fabric.

Two coins of Kururaya, assignable to *circa* second century BC were found. It is interesting to note that *Kururaya Kurara Koras Korghara* with *Nandinagara* appear in numerous Sanchi votive inscriptions.

Among the antiquities mention may be made of terracotta and stone gamesmen, miniature bowls, beads, bone points, arrowheads, copper bells and elongated gold pendant.

Structures of this period consist of rammed floor, walls of consolidated gravel, *kankar-mixtd* sticky black cotton soil.

Period V *(circa* 200 BC to AD 200) is represented by black, red, degenerated black and red and coarse variety of black-slipped wares. The coins belonging to Sin Satkarni *(circa* 128 tolO BC) and copper punch-marked coins were also found. Main structures are ring wells, walls, rammed floor strewn with roof tiles both corrugated and perforated, brickbats and broken pottery.

Antiquities recovered are stone legged-quern with herring-bone design, pestles; bone points; glass bangles and terracotta beads, etc. This period is disturbed because of brick robbing and later building activities. The site was finally abandoned due to great flood as evident from the river gravel, scattered all over the eastern and western sectors of the mound.

Period VI (ninth-tenth century AD) is represented by a number of Brahmanical and Jaina temple remains. A large number of coins of medieval period, including one of Balban (AD 1265) and an image.

of Ganesa and *Tirthankara* in red.sandstone, assignable to tenth century were also found. It appears that the mound was occupied by the seasonal migrants who robbed building materials.

The habitation of NDR-2 was dug upto the depth of 1 .62 m revealing four layers. Layers 3 and 4 consisting of grey and light yellow earth is marked by red-slipped, black-and-red ware, punch-marked copper and one silver coin, copper bells, iron nails, arrowheads, iron slag and a solitary stray microlith, akin to period III B of NDR 1.

Layers 1 and 2 are composed of black soil mixed with brickbats and roof tiles alongwith pottery of preceding period. Spouted vessels and micaceous ware make their first appearance. This coincides with Period IV of NDR-1. The only structures encountered are rammed floor, mud wall dug deep with foundations into the natural soil.

The layers of both the trenches are marked by large number of pits, and undulations, probably depicting disturbances from the beginning of the settlement. From the surface finds of relic caskets it appears that it was a large Buddhist establishment. Further the surface of the mound shows evidence of rammed brick roads, flanked by ring wells and soakage jars. It appears to be a flourishing trade centre of Avanti kingdom and must have vied with Tripuri, Vidisha and Ujjain. In the vicinity, about 35 km is Panguraria (ancient Pandukulikagrama) denoted by the mound of Nanoor on the Narmada, the find-spot of Asokan inscriptions.

MAHARASHTRA

57. EXPLORATION IN DISTRICT AHMADNAGAR.—In the course of village-to-village survey, S.S. Parekh of the Aurangabad Circle of the Survey noticed antiquarian remains at the following sites:

Taluk	*Village/Site*	*Nature of remains*
Kopargaon'	Sangwi	Late medieval Siva temple, *samadhi* and loose sculpture of Seshasayi Vishnu
-do-	Velapur	Ruined Siva temple and *linga* of late medieval period
Sangamner	Chincholi Gurav	Late medieval Ganesa temple
-do-	Kaote	Late medieval step-well, *havelis* and potsherds of early historical and medieval periods
-do-	Nalvande	Late medieval *havelis*
-do-	Paregaon	Late medieval gateway and remains of Siva temple
-do-	Samnapur	Late medieval stepped-well and residential building remains
-do-	Tisaon	Savalda ware, early historical and historical ceramics

58. EXPLORATION IN DISTRICTS AMRAOTI AND YEOTMAL.—In the course of exploration in the submergence area of the Bembla River Project, Ajit Kumar of the Aurangabad Circle of the Survey noticed antiquarian remains at the following sites :

Districts	*Taluk*	*Village/site*	*Nature of remains*
Amfaoti	Chandur	Dhamak	Early historical
-do-	-do-	Guikhed	Early historical
Yeotmal	Yeotmal	Dighikhanapur	Early historical
-do-	-do-	Fatehpur	Medieval temple remains
-do-	-do-	Kopra	Chalcolithic and early historical
-do-	-do-	Kuraigaon	Early historical
-do-	-do-	Pahur	Early historical and image of Vishnu datable to thirteenth-fourteenth century AD
-do-	-do-	Paloti	Chalcolithic and early historical
-do-	-do-	Pimpalkhuta	Early historical and loose sculptures and temple remains, assignable to thirteenth-fourteenth century
-do-	-do-	Savanga	Early historical pottery

59. EXCAVATION AT DAULATABAD, DISTRICT AURANGABAD.—In continuation of last year's *(1985-86,* pp. 56-57) work, the Aurangabad Circle of the Survey under the direction of P.N. Kamble and B.R. Mani, assisted by M.R. Dhekane, M. Mahadevaiah, Ajit Kumar, S.S. Parekh, D.N. Sinha, D.T. Asar, D.L. Sirdeshpande, R.D. Ingle and G.L. Gaikwad resumed excavation in the DLB-3 area. The objective was to know the details of settlement pattern of Indo-Islamic period.

The excavation revealed remains of houses on the western side of a lane which emanates from the main passage which runs in east-west direction along the southern side of the Elephant Tank. The average width of the lane is 2.50 to 3 metres. Three different houses situated to the western side of the lane have three entrances which open into the lane, the length of which is about 25 m and to its southern end a sub-lane issues and takes a south-westerly turn.

The residential structures are of coarse rubble masonry set in mud mortar. At places, architectural fragments of the preceding Yadava period have been reused. At some places lime mortar was also used. The house on the tower terrace of the northernmost side does n6t have any step but the two houses to the south of it being placed on a higher terrace about 0.75 metre above have well-laid flight of steps at their entrances. Well-demarcated rooms, kitchen, hall and courtyard were also exposed.

In addition to this, three rectangular cells 1 to 1.25 m long and 60 to 80 cm wide were exposed. These cells might have been bath places as they are associated with a stone platfonn and show traces of lime plaster. A number of curved and flat roof tiles were found. The majority of the area of courtyard

has stone laid floor. A circular depression (25 cm in diameter) was noticed encircled with stone pebbles possibly to keep a large water pot near the entrance of the kitchen in the courtyard. The rectangular kitchen (4.50 m X 2.20 m) has two entrances and a low platform. Besides, two hearths and another circular depression to keep water pot was also found.

The drain, made of stone pebbles and covered with stone blocks, runs from west-to-cast, parallel to the northern wall at a distance of 1.20 m. The drain is 4.25 m long and 20 cm wide. It originates from a small ditch (50 X 42 X 25 cm) connected by a small channel in the north to another ditch (67 X 50 X 28 cm). The drain penetrates the eastern enclosure wall of courtyard and opens through a gutter outlet in the lane.

The antiquities include one silver and nine copper coins with Arabic-Persian legends; copper finger ring, amulet, bowl, earring and buckle; brass hexagonal sheet; iron nails, arrowheads, hook and door latches and finger tip; ivory pendant; conch shells; glass bangles; stone octagonal *linga,* lamp, beads, grinding quern and ball; and terracotta ball, animal figurine and lamp.

The ceramics included red slipped ware, local glazed ware, Chinese porcelain, Celadon ware and other common types of medieval pottery. Among the shapes, storage jars, bowls and dishes are significantly found in abundance.

60. EXPLORATION ATHARSUL, DISTRICT AURANGABAD.—B.R. Mani of the Aurangabad Circle of the Survey collected more than seven hundred microliths comprising of different types ofblades and bladelets, triangles, trapezes, borers, points, fluted and other cores, mostly on chalcedony, agate and chert.

The 1-80 metre thick section facing north, exposed on the right bank of the river Kaum (Kham) has three distinct deposits. The topmost soil deposit is 45 cm thick. Below it is a small size gravel deposit in sand which is 20 to 25 cm thick. The third one is a deposit of compact ferruginous clay of reddish colour and is 1.10 m in thickness upto the river-bed. As the topmost deposit has been washed away, the gravel deposit is exposed in an area of about 100 metres (east-west) in length and about 50 metres (north-south) in width at a distance of about 100 metres from the point where the river which flows towards the east, takes a turn to the south. Thus the microliths are found in abundance on surface in that particular area where gravel deposit is exposed.

61. EXPLORATION IN DISTRICT KOLHAPUR.—In the course of exploration in the submergence area of Chitri Irrigation Project, M. Mahadevaiah of the Aurangabad Circle of the Survey noticed a Gaja-Lakshmi sculpture, assignable to eighteenth century in village Avandhi.

62. EXPLORATION IN DISTRICT PUNE.—In the course of exploration in the submergence area of Bhama (Askhed) Irrigation Project, D.N. Sinha of the Aurangabad Circle of the Survey noticed the following antiquarian remains :-

Taluk	*Village/site*	*Nature of remains*
Khed	Anawale	Loose sculptures of Kala-Bhairava, Uma-Mahesvara, Durga and Vitthala Rukmini
-do-	Parale	Chert cores and loose sculpture of Ganapati, Vitthala, Rukmini, *Siva-linga* and hero-stone of late medieval period
-do-	Waki	Loose sculpture of Khandoba, Nandi, *Siva-linga,* pillar fragments and hero-stones, all datable to the late medieval period

63. EXPLORATION IN BORI, DISTRICT PUNE.—In the course of geomorphological investigation, V.S. Kale of the Geography Department of Poona University, discovered an Acheulian site at Bori (19°6' N and 75°5' E). Subsequently, V.S. Kale, alongwith S.N. Rajaguru, S.B. Ota, R.K. Ganjoo and S. Mishra of Deccan College, visited the site. Almost 200 artifacts were collected from the surface of the gravel. A number of animal fossils, including a tusk of *Elephas* sp. was found in the gravel.

The site of Bori is located on the left bank of the river Kukadi, a tributary of the Ghod river. It forms pan of the Bhima drainage and has its source in the Western Ghats. The Acheulian artifacts and occasional animal bones are being eroded from a 2 m thick sandy gravel exposed in the modern river bank. This gravel varies from well-cemented to uncemented by calcium carbonate. The pebbles arc predominantly sub-rounded basalt clasts, which have a thin weathering rind. It is clast supported and cross-bedded and represents an ancient point bar. This gravel is underlain by a reddish brown sandy silt 50-70 cm thick rich in nodular calcretes. The gravel is overlain by 8 m of yellow brown sandy silt with bedded and nodular calcretes with lenticular patches of pebbly sandy gravel. Occasional patches of fissured clay also occur within the yellow silt. No major disconformity could be established in the sequence, which appears to record an alternation of channel and overbank facies. The fluorine content of the bones falls into the Late Middle pleistocene group.

The artifacts include 5 heavy duty tools, 1 hammer stone, 8 cores and 157 flakes. The tool assemblage consists of a few heavy duty tools, all on doleritic basalt and a large number of small flakes on both basalt as well as various types of multi-coloured cherts. In the heavy duty componant there arc 4 trihedran handaxes. These handaxes have cortex remaining on part of the butt. The flake scars are large, deep and relatively few in number. The flaking is along three planes to produce a sharp pick-like working end. One ovate handaxe is present. It also retains some cortex on the butt. A flake has been removed from the tip to produce a cleaver like edge. One heavy duty tool has cortex at the butt end with bifacially flaked sides and transverse edge coming to a trihedral point. One crude cleaver, on a nodule, is present. One large thick pointed flake has retouch on one side and a sharp flat end. The cores are mostly smaller than the heavy duty tools and could have been used to produce the large number of flakes. The cores are not standardized. One quartz pebble shows signs of battering. The flakes are mostly small (4.6 cm) with 109 on basalt and 48 on silica. The asemblage shows little sign of refinement in the heavy

duty component with atypical handaxe types predominating. The light duty component is still to be studied. The raw material used is mostly rare to absent in the gravel. The basalt tools are made of a variety of hard, fine-grained dolerite. The chert tools are mostly on multicoloured cherts from the Deccan trap. The tools appear to have been made from nodules weathered out of the dyke material rather than river pebbles. While some of the tools are slightly abraded by river action, most of the tools, specially the basalt flakes, are very fresh.

64. EXCAVATION AT WALKI, DISTRICT PUNF..—In continuation of last year's work *(1985-86,* pp. 60-61), the Department of Archaeology, Deccan College, Post-graduate and Research Institute, Pune, under M.K. Dhavalikar and Vasant Shinde, assisted by Shubhangana Atre, Y.S. Rasar, V.G. Vishwasrao and Kisan Humbre carried out excavation with a view to study the house plans and behavioural pattern of the chalcolithic inhabitants at Walki.

The excavations were confined to the western half of the mound and the trenches opened last year were sunk down upto the virgin soil. Altogether 52 houses of the earliest inhabitants were exposed. All of them were roughly circular on plan and the average diameter ranges between 2 to 3 m. These round huts have been observed to form distinct clusters and 5 such clusters have been identified, each of which consists of about 5 to 6 huts. A threshing floor, an animal shed (1 or 2), a haystack, a bin platform and/ or silo and a living hut formed one cluster. A hard floor, usually without post-holes suggesting that it was open to sky, has been identified as a threshing platform. A couple of huts in each cluster with uneven floors, might have been used for keeping either animals like sheep/goat or poultry during the night. A living hut was slightly bigger and had well made floor. Besides these, in each cluster there was a circular patch which does not seem to be a house floor; it may mark the place where hay was stacked. Each cluster also had either a circular mud platform (dia. 1 m) or a circular pit-silo (dia. 1 m) for storing grain. A fire pit in most of the clusters was located outside in the open space but in few cases it was located within the living huts.

The excavations have yielded altogether 10 burials of which nine were of the twin-urn variety and only one was extended. The extended burial (No. 13) located inside the circular hut (No. 94), contained three pots of the painted Jorwe variety, of which one was a spouted vessel and the remaining two were concave-sided carinated bowls.

Among the antiquities mention may be made of two unique objects, viz. a part of a rope-traction ard made of a bone piece and a seed-drill of antler.

One of the large burnt rectangular houses, exposed last season *(1985-86,* pp. 60-61) yielded the lower portion, most probably of a rope traction ard, which is the only of its kind in India. It looks like a spade with a triangular blade, carved out of a shoulder blade of cattle. It has a perforation almost in the centre. Similar specimens, but having a long shaft and two perforations near the upper border of a blade, have been reported from Satrup Moor in Denmark. Initial experiments have proved that it is adopted to loose soil for covering sown seeds. The specimen found at Walki might have been attached to a wooden shaft and the perforation may have been intended for acommodating a rope to pull forward.

The excavations have also yielded a seed-drill of antler, the only one of its kind in India. It is broken, but the extant length of the surviving piece is 33 cm. It was a hollowed antler.and has a sharp

oblique cutting edge. A small perforation just above the cutting edge was perhaps made to accommodate a rope for pulling. This seems to be a multipurpose tool used for ploughing loose soil as the sharp oblique cutting edge would suggest and also for sowing seeds simultaneously.

From the excavations carried out this year is proved, beyond doubt, that Walki was a chalcolithic farmstead, which was occupied only seasonally. It is quite likely that around thirteenth century BC when the Jorwe population at Inamgaon increased beyond carrying capacity of the region, a few families arrived at the site solely with the purpose of cultivating the rich tract of black cotton soil around the site. They constructed a few make-shift huts which they occupied during the winter, harvested the crop and returned thereafter to Inamgaon. From the evidence it appears that at least two families lived there throughout the year obviously for the upkeep of the farmstead. They also have six pit-silos and four platforms for storing extra grain for the whole year. Most of the child burials were confirmed to this pan of the habitation, which is significant.

65. EXPLORATION IN BARSIII, DISTRICT SOLAPUR.—During the course of the Exploration in the village Korphale, of Taluk Barshi, D.N. Sinha of the Aurangabad Circle of the Survey, collected early historical and early medieval pottery.

66. EXPLORATIONS IN DISTRICT SOLAPUR.—During the course of the exploration, M. Mahadevaiah of the Aurangabad Circle of the Survey noticed the following antiquarian remains :

Taluk	*Village/Site*	*Nature of remains*
Sangola	Chinke	Ruined Siva temple, loose sculptures of Ganapati, Lakshmi and *mithuna* figures, all datable to thirteenth-fourteenth century AD
-do-	Medasingi	Loose sculptures of Mahishasuramardini, Narasimha, Gaja-Lakshmi, five-hooded Naga, Ganapati, twelve *rishi* figures with lotus in the centre, two *vyala* figures, broken Vishnu image, eight pillars, all datable to the thirteenth-fourteenth century AD

MEGHALAYA

67. EXPLORATION IN CENTRALGARO HILLS.—T.C. Sharma and H.C. Sharma assisted by the final year students of the Department of Archaeology, Gauhati University, carried out exploration in the Central Garo Hills, mainly in the Ganol river valley (Lat 25°34' N ; Long 90° 16' E) and discovered five Palaeolithic sites viz. Mechingrenchap-II (MGC-II), Didamigiri-II ((DDG-H), Didamigiri-III (DDG-III), Michimagiri-IV (MMG-IV) and Sambalakong. The sites are located within 2200 m and 2400 m above MSL. The sites are exposed either due to erosion or at the time of clearing the jungles for Jhum

cultivation. A large number of tools are thus exposed on the surface, while many of them art still embedded in the thick silt. All tools are made of rock from doleritic dyke. The huge blocks of dyke were utilized by the Stone Age man for manufacturing of different types of tools. The total collection of the artefacts is 557. The percentages of collected artefacts of each site are Didamigiri-H (11.66%), DidamigiriIII (18.85%), Mechingrenchap-II (12.03%), Michimagiri-IV (37.16%)andSambalakong (807%). The tools are heavily weathered and patinated. The sites appear to have yielded a mixed assemblage of Lower, Middle and Upper Palaeolithic tools in addition to a few microlithic and neolithic tools. The frequency of occurrence of different tool types in the explored sites are: (1) chopper (0.89%), handaxes (3.59%), cleavers (3.77%), awls (0.89%), knives (0.53%), blunted back knife (3.94%), scrapers (21.18%), points (5.38%), borers (2-69%), burins (0.53%), blade-flakes (8.43%), other types and waste flakes and cores (48.11%).

ORISSA

68. EXCAVATION AT LALITAGIRI, DISTRICT CUTTACK.—In continuation of the last year's work *(1985-86,* pp. 62-63), the Bhubaneswar Circle of the Survey under G.C. Chauley, assisted by B.V. Rao and G.N. Srivastava resumed the excavation at Lalitagiri.

The excavation was concentrated in the area near the banyan tree towards the north-east of the sculpture shed and identified as the 'stupa-area' (pl. XXVI A). Remains of stupas of various dimensions and forms, square and oblong pedestals, stone sculptures, pottery and terracotta plaques stamped probably with the *dharinis* and remains of an apsidal brick structure are the notable finds of this year's excavation.

The apsidal brick structure could not be exposed fully due to modem construction. The exposed remains comprise of only half of the southern .wall and the apsidal-end. Four base mouldings are available on the southern fa?ade of the apsidal portion, while the back-side and northern faces are traceable only in outline below the plinth level. The structure is facing towards east. For the foundation, *kankar* nodules mixed with fine mud had been rammed over a compact rubble packing, over which brick courses were laid down with very fine joints. The bricks measure 42 X 24 X 8,39 X 22 X 7 and 29 X 20 X 7 cm. The length of the southern wall of this apsidal structure is approximately 14 metres. The base mouldings which have been found intact at one place are 1.65 m high rising from the stone pavement consisting of 22 courses. Inside the apsidal portion was found the base of circular *chaitya-griha* (stupa) built in stone. This pavement was extended towards eastern side (entrance side) and a ramming of *kankar* nodules mixed with lime etc., had been done over this. A head of Buddha carved out of khondalite stone has been found lying in the centre of this stupa (pl. XXVII A). Probably this head was enshrined as a presiding deity in this structure. Thus this structure can be construed as a Buddhist *chaitya* or temple. The fallen monolithic carved pillars around this *chaitya* show that the *chaitya* was encircled by pillars. The other structures and stupas exposed during the excavation are (a) sjupa built either in stone (khondalite) or in bricks; (b) votive stupas made either of a single stone of two stone components; and (c) square and oblong pedestals built in both stone and brick.

This year, the base portion of ten circular stone stupas varying in size, four brick stupas and fifty votive stupas have been found. Among the stone stupas the largest is approximately eight metres in diameter. The drum portion is raised upon three receding base mouldings. A stone pavement (pl. XX VIIB) of 10 X 10 m had been provided around as an apron and for the ambulatory passage. Another stupa (4 m in dia.) is a good example of fine ashlar masonry. In the structural stupas only the outer encasing is constructed with all-dressed stone slabs or bricks while the inner core is filled with mud and rubble material. In brick stupa mud-mortar has been used as binding material.

The votive stupas (pl. XXVI B) have been found mainly around the largest stone stupa. In the single stone stupas, there are two interesting examples of carving and relief work. One is provided with the Buddha relief on four sides alternated by perforated niche motifs. Another single stone votive stupa is carved with the *kuta* and *sala* motifs. The double stone votivtstupas consist of a drum piece and an *anda* portion fixed over the former. A socket hole is always found at the top for fixing a shaft or *yasti,* which have been discovered in a fairly large number. Besides these, a few square and rectangular pedestals of various sizes in both brick and stone have also been unearthed.

Other important finds from the excavation are stone sculpturesof Buddha (pl. XXVIII A). Besides the loose and fragmentary sculptures, 25 sculptures of Buddha in various postures have been found arranged in an alignment following the curvature of the apsidal brick *chaitya.* In this alignment, votive stupas had been interspersed with sculptures. Besides, six terracotta seals were also found.

The potsherds consist mainly of red ware, both slipped and washed dull ware, black ware and black-slipped ware. A very thick coat of slip has been noticed in the red slipped ware. The black-slipped ware is of very thin section. Besides the wheelmade pottery, a few sherds of partly moulded pots have also been found. Vases, bowls, dishes and *handi* are the common shapes of pottery. The fragments of miniature pots having perforations were also found.

The stratigraphy of the site is disturbed due to heterogeneous depositon. It has been noticed that one structure had been constructed directly upon, the other, without removing or dismantling the previous one. However, two main floor levels can be distinguished which correspond to the beginning and end of the activities at the site. The inscribed pedestal and stupa in Trench G-2, the brick stupa in Trench E-4, the largest stone stupa in E-3 and the apsidal brick temple are almost in the same floor level though they have their individual floorings and belong to the earliest period.

The apsidal brick temple may be the earliest construction of this complex and the other votive structures might have taken their place around it later on. The apsidal structure at Lalitagiri has close resemblance with the apsidal structure (temple) of Nagarjunakonda and Chejarala in its mouldings and brick size.

The inscription found engraved on a stone pedestal erected near the apsidal temple can be dated on palaeographic basis to about sixth century AD. The inscription can be tentatively read as *ranadhirenutara* (pl. XXVIIIB).

The first floor level had fallen into disuse perhaps due to the accumulation of debris of the dilapidated structures over which were built later structures.

The second main floor, level consists of a stone pavement laid around the apsidal brick temple. As per the evidence found in excavation, it was the last constructional activity in the site. This pavement

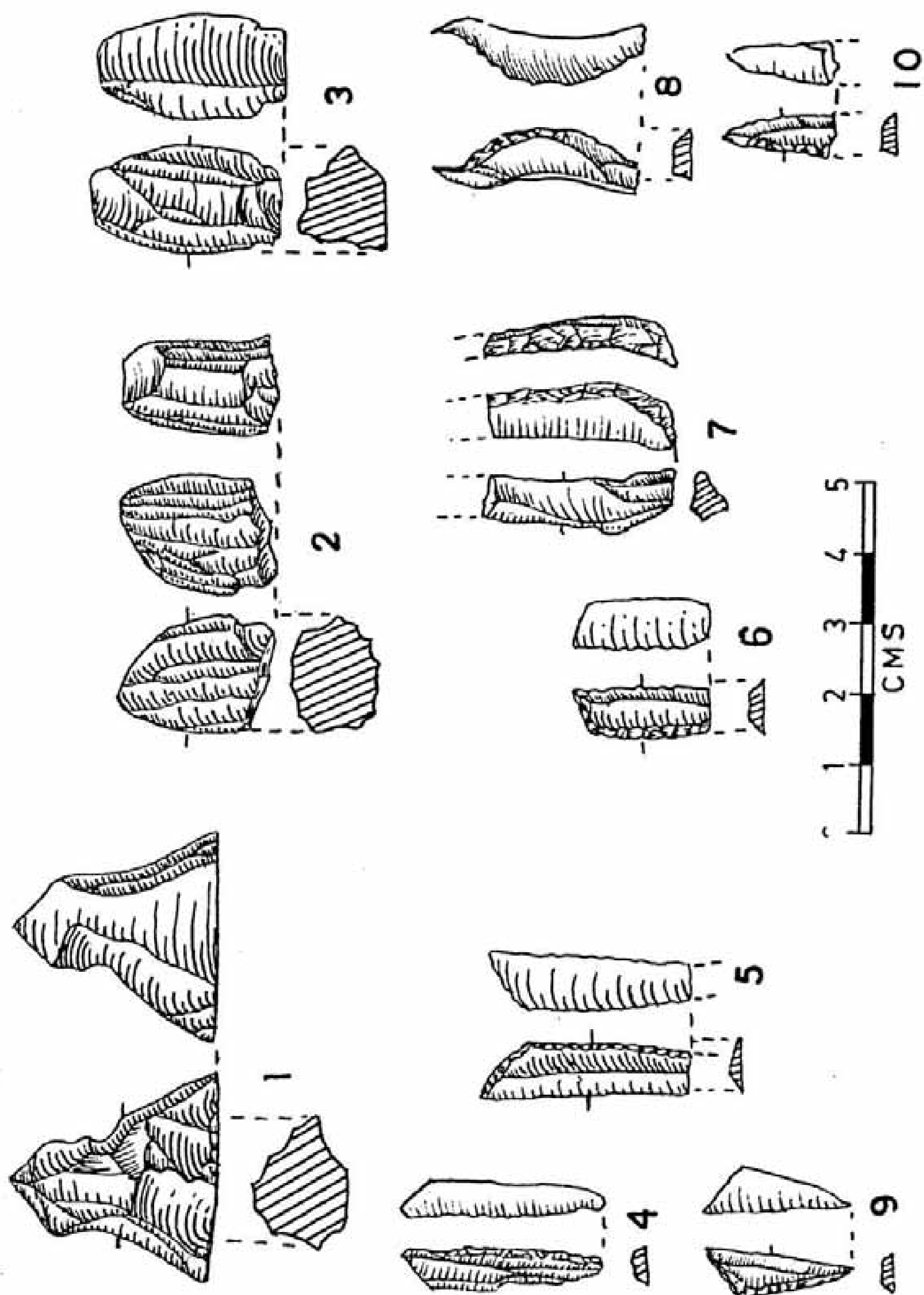


FIG. 8. *Keonjhar: Stone blades*

was laid upon the 80 cm thick deposit over first floor. Most of the stones used in this pavement havt round edges and show their secondary use, perhaps obtained from the earlier structure of the same nature.

The destruction of stupas and defacing of the sculptures on a large scale suggests a period of turmoil, caused either by an invader or by a different sectarian group.

69. EXCAVATION AT UDAYAGIRI, DISTRICT CUTTACK.—In continuation of last year's work *(1985-86,* pp. 63-65), the Excavation Branch-IV of the Survey undertook excavation work at Udayagiri under the direction of G.C. Chauley assisted by Amarendra Nath, K.M. Suresh, P.N. Biswas, P. Biswas, K. Srimani and M.P. Singh.

The excavation revealed remains of a huge monastic complex having cells (pl. XXIX A) all around approachable by a common verandah on all the four sides with a vast open courtyard in the centre. On the eastern side of the courtyard, traces of main entrance leading to the monastic complex were noticed. Opposite the main entrance, a shrine chamber was also unearthed. The door-jambs of the *garbhagriha* are beautifully carved and have the depiction of scrolls, floral designs, *yakshas, kinnaras* and the Buddha on. the central part of the lintel (pl. XXIX B). About nine beautiful sculptures of Buddha and Buddhist divinities were found kept in a row on both sides of the door jamb. Simultaneously, when the interior of the *garbha-griha* was exposed, a colossal image of Buddha (pl. XXX A) made out of a few blocks of stones with fine joints and eight sculptures of Buddha, Bodisattva Vasudhara-were found placed within the shrine chamber (pl. XXX B). Most of the sculptures had the Buddhist creed engraved either on the top part or at the back of the image. On stylistic grounds these sculptures may be dated to seventh-eighth century AD. A courtyard measuring (12 X12 m) with twenty-one cells were exposed.

The north-east corner of the monastic complex is provided with a vaulted arch-opening, which was probably used as a secondary gate. Two monolithic columns, which were once supporting the superstructure above verandah, were found *in situ.* Traces of basement of many other pillars were also seen.

From the very nature of the ruins, it is found that after the monastic complex was abandoned, it became a target for vandals. The local people removed the bricks and stones as a result of which no uniform level is found anywhere. At places, the entire walls were found missing.

The important finds included terracotta and sun-baked seals and sealings (pls. XXX C and D) with the inscription *Sri Madhavapura MahavUiara Arya Bhikshu Sanghasha.* It shows that this monastery was known to the Buddhist world as Madhavapura Mahavihara and not Udayagiri as it is known today.

Besides, terracotta beads and two tiny sculptures of Ganesa and Garuda were also found.

70. EXPLORATION IN DISTRICT KEONJHAR.—Pradeep Mahanty of the Deccan College, Post-graduate and Research Institute, Pune, brought to light fifty-seven mesolithic sites at Champura, Gasipura, Ghatagaon, Palespal and Patna taluks of the District. Most of the sites are associated with granitic outcrops, while a few are found in the foothill region lying close to streams. These sites are now located in dense forests. Majority of the sites are primary in nature and still preserve habitational deposits. The occurrence of isolated mesolithic artefacts in association with rock outcrops was also observed at quite a few places.

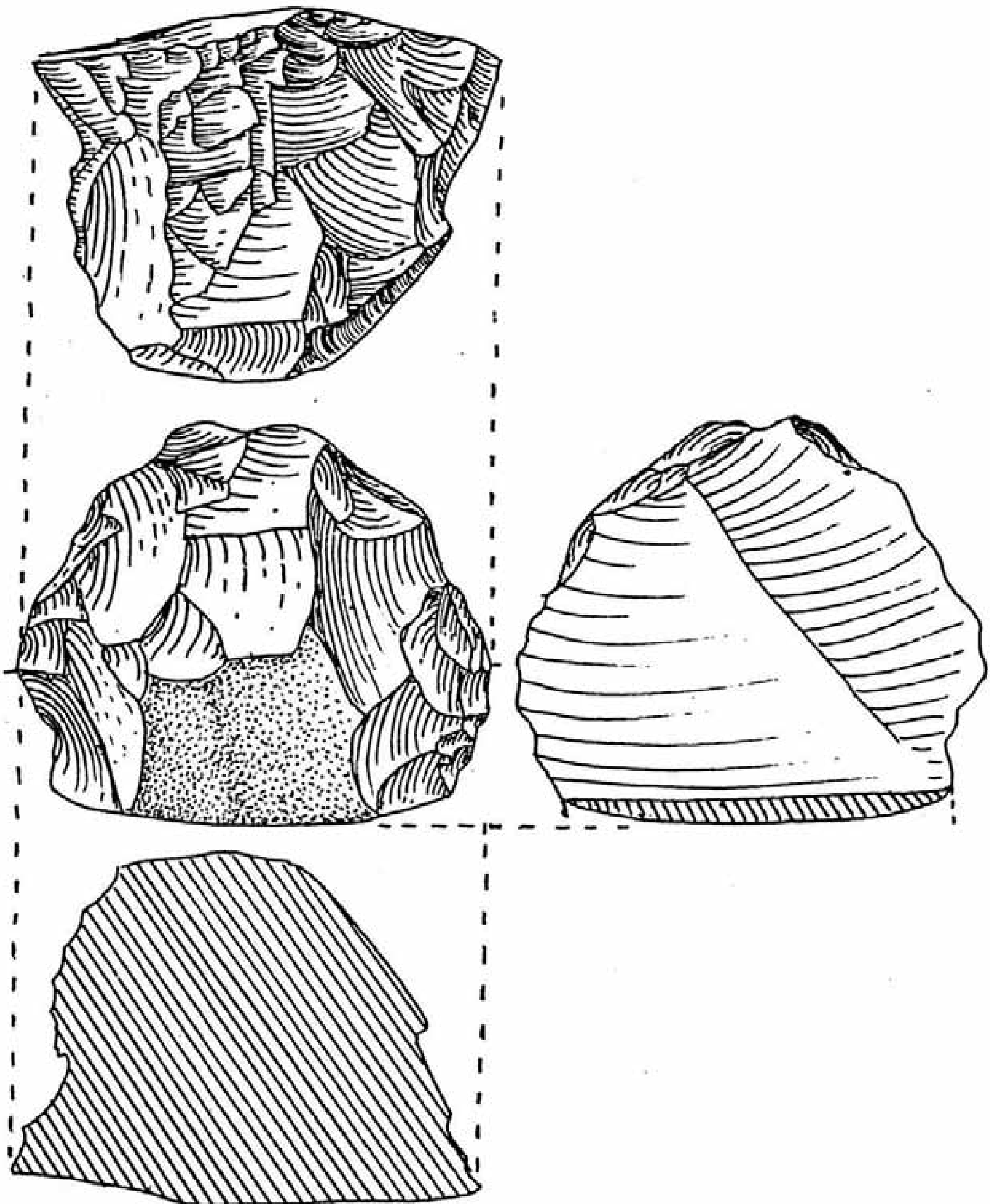


FIG. 9. *Keonjhar : Horse-hoof scraper*

A well-developed blade technology is the most outstanding feature of themicrolithic assemblages (fig. 8). Chert is the principal raw material, followed by quartz, chalcedony and lydianite. The lithic component is characterized by backed blades, obliquely truncated blades, retouched blades, burins, knives, triangles, trapezes, crescents, lunates, side scrapers, round scrapers, steep scrapers, thumb-nail scrapers, flake-cores, blade-cores, microblade cores, utilized blades, flakes and chips.

However, the most outstanding feature of these assemblages is the occurrence of heavy duty implements made of different raw materials, chiefly dolerite, followed by quartzite and limestone. In most of the sites heavy implements and microliths occur in mixed clusters. The heavy duty implements comprise of chopper-chopping tools, horse-hoof scrapers (fig. 9), picks, knives, large scrapers, limaces and flakes. Celts fashioned by means of flaking, pecking, grinding and polishing are another interesting category of implement.

The horse-hoof scraper is predominant among these heavy duty implements. In general, these have steep edges obtained by means of step-flaking. These artefacts are mostly made on thick doleritic slabs and nodules. Most were prepared by minimum flaking along their margins, leaving much cortex intact. In all cases, the flat bottom of the raw material has been retained. Flake scars are generally shallow and do not show any prior preparation of the core. The nature of the flaking suggests the use of a controlled hammer technique, and secondary flaking along the margins is not very common.

PUNJAB

71, EXCAVATION AT SANGHOL, DISTRICT LUDHIANA.—In continuation of last year's work *(1985-86,* pp. 67-69), the Excavation Branch-II of the Survey in collaboration with the Department of Cultural Affairs, Archaeology and Museums, Punjab, under the overall direction of C. Margabandhu assisted by G.S. Gaur, L.S. Mamani, B.B. Sharma, J.S. Bisht, Chander Bhan, Shyam Lai and D.D. Dogra of the Survey and K.K. Rishi, Kuldip Singh Sindhu, Gurdev Singh and Hira Singh of the Punjab State Department resumed excavations at Sanghol with the view (i) to further expose the Kushana palatial-complex and other structures at the Hathi wara mound (SGL-1), (ii) to confirm the existence of 'overlap' between the Bara and the PGW cultures at localities other than those already excavated in the previous seasons, and (iii) to ascertain the nature of the cultural components of the Post-Kushana Period. For the first objective, the already excavated area at SGL-1 was further extended; for the second, trenches were laid at new areas namely SGL-12 and SGL-6 and for the last, two trenches were taken at SGL-8.

Excavation at SGL-1 further exposed the palatial-complex on the northern and eastern sides. The open hall (courtyard ?) characterized mainly by bumt-brick floors and also by the brick-builf pathway and possibly circular pillars etc., was partially exposed. Considering its occurrence more or less on the same level and belonging to the same structural phase and also of its uniform nature of running plan in all the trenches encountered, this appears to be a long and spacious congregation hall (courtyard) for assembly. Since it is further extending without a turn, hence it seems to be a fairly large complex building, but its exact nature and features are yet to be determined.

Two contiguous rectangular cistern-like structures which may be a *havanakunda* (?) or part of a temple (?) or a ware-house (?) were brought to light. Each cistem-like structure measures 3.10 m in length, 1-36 m in width and 1.32 m in height (pl. XXXI A). These were built in a continuous scries connected by burnt floor and form part of a uniform plan with three offsets internally.

A partly-exposed house-complex consists of a kitchen, living room, bathroom, verandah and *chabutara* (platform) attached with the side entrance door which opens in the sub-lane. A small brick drain partly closed also project upto the outer wall of the house. It may be recalled that the main front entrance in the form of a stepped up ramp was already exposed during the last season. In all five structural phases with floors were traced out in this area in which a cluster of structures with the main walls in brick were encountered. All of them belong to the Kushana Period.

The excavation at SGL-2 brought to light remains from the Late Harappan (Bara) to the Kushana period. Six structural phases were noticed in the Bara period. The walls were made of mud, except in Phase IV, where blocks of mud measuring 48 x 40 x 8 cm have been used. Floors of rammed earth were also exposed (pl. XXXIB). Further, interesting evidence of a burnt terracotta domical object was found *in situ* on the floor. Signs of burning along with ash indicate it was fixed in position adjacent to a side wall of the room.

Important antiquities of the period include beads of terracotta, agate and faience; circular and oval terracotta cakes; faience and terracotta bangles; and terracotta wheels and balls.

Following the Bara culture (Period I) comes the 'overlap' phase in which Late Harappan pottery, black-slipped and plain grey ware were found. The dominance of the Bara pottery was also perceptible. This shows that the people using black-slipped and grey ware had lived together for some time. It has, however, to be added that the PGW horizon is conspicuous by its absence.

The early historical period is characterized by black-slipped and the associated red wares. The structures were built of large sized mud and burnt bricks and are mainly pre-Kushana in character. Notable antiquities included beads of semi-precious stones and terracotta and bone points.

During the Kushana period, four structural phases represented by walls of burnt as well as mud bricks were exposed. The Kushana house is represented by kitchen, two or three small rooms, storage bins, round hearths and mud-brick steps.

Excavation at SGL-9 revealed fivefold cultural sequence beginning with the Bara, followed by an 'overlap' phase between Bara and Painted Grey Ware (?), grey ware and black-slipped ware, which in turn was followed by the Kushana, Gupta and late medieval periods.

It has to be further stressed that the exact nature of the 'overlap' phase is to be further ascertained by exposing larger area as there appeared to be levelling of activity at this time of habitation.

The cultural components in the form of pottery, objects of daily use and houses built of reused material of the Gupta and the late medieval periods have also.been found.

Excavation in Trench SGL-8 revealed three phases : the early medieval, Gupta and the Kushana periods.

This part of the mound had also been excavated earlier yielding remains of similar nature. It was mainly occupied during the Gupta period. The Kushana period was represented by pottery and objects

of daily use. The area denotes the periphery of the Kushana township. A son of transitional phase from the Kushana to the Gupta period was also noticed.

There were prolific activities here during the Gupta period represented mainly by the Red Polished Ware, stamped pottery, kaolin ware and other associated materials. A burnt brick wall made of reused Kushana bricks was also exposed. Early medieval period is represented by pottery and a few antiquities.

Excavation in SGL-6 revealed presence of the Bara culture, followed by the overlap phase which is the continuation of the Bara pottery in association with grey ware of the PGW lineage and black-slipped ware. In the early historical phase the structures were built of mud and burnt bricks of fairly large size, ascribable to the pre-Kushana times. Coins of the Parthian rulers were also found in upper levels.

Excavation at SGL-12 revealed the earliest occupation datable to the Late Harappan period along with 'Bara' ceramics and antiquities. Though no structural evidence is available, floor remains made of rammed clay are found. The layers are horizontally laid and occupation is of a fairly long duration. Traces of erosional deposits possibly reveal some flooding of the area at the late stage of occupation.

So far as the antiquities are concerned, these are quite rich, both in type and varieties. The foremost among them are human (pl. XXXII A) and animal figurines. Some of them anistically made in the form of handles both modelled as well as made by mould. Notable among the animals represented include bull and monkey in various postures; some of the bird figurines are also quite realistic. Other dominant types include terracotta discs (pl. XXXIIB), circular as well as rectangular, decorated with designs and flower motifs on one side, while on the other having some typical details such as warrior riding a horse and with animal motifs, plain and decorated wheels, ear-studs, toy-can frames, skin rubbers, stamp with handles (pl. XXXIII A), rattle, famale lamp-bearers, balls and other archaic type of figurines. Many typical clay tablets (pl. XXXIII B) were found in rectangular and square shape with lines incised on them, which were perhaps son of jewellers' weights.

Important is the shell industry which is evidenced by varieties of bangles, beads, pendants and other decorated objects, cut columela, etc. Other objects include beads and pendents of semi-precious stones, terracotta, ivory and copper, ivory and bone objects such as dice, bangles, decorated pieces, etc.

RAJASTHAN

72. EXPLORATION IN DISTRICT BHARATPUR.—In the course of the village-to-village survey, D.N. Dimri of the Jaipur Circle of the Survey noticed the following sites of archaeological interest:

Taluk	*Village/Site*	*Nature of remains*
Bayana	Aghawali	Mound
-do-	Bansroli	Mound
-do-	Farso	*Haveli* and mound
-do-	Milakpur	Mound
-do-	Scvvla	Structural remains
-do-	Sikandara	Mound

Taluk	*Village/Site*	*Nature of remains*
Wair	Bhogora	Ruins of temple
-do-	Govindpura	Mound
-do-	Kherli Goojer	Mound
-do-	Lakhanpur	Ruins of building and mound
-do-	Maharajpur	Mound
-do-	Moreda	Mound
-do-	Newar	Building and mound
-do-	Nither	Brahmanical and Jaina sculptures

TAMIL NADU

73. EXCAVATION AT DARASURAM, DISTRICT TIIANJAVUR.—In continuation of last year's work *(1985-86,* p. 71) the Madras Circle of the Survey, under the direction of K.P. Poonacha assisted by K.K. Ramamurthy, G.S. Narasimhan, D. Dayalan, R. Balaraman, Manickam and T. Elumelai continued excavations in the area between the outer and the inner *gopura* of the Airavatesvara temple in order to ascertain the nature and extent of the stone basement which had been encountered earlier in a trial excavation. The excavation revealed a huge rectangular brick platform measuring 15.5 m (nonh-south) X 11 -5 m (east-west) just beneath the stone basement. The brick platform consisted of 25 courses with offsets at the middle on all the four sides. The total height of the platform was 2.5 m. On the northern and southern sides of this platform two parallel walls with a varying width of 1.35 m and 1.50 m just abutting the brick platform were also exposed. The parallel walls were separated by a distance of 1 .75 m. On the southern side, the walls were extant up to a length of 10 m. On the northern side, the western wall runs up to a length of 10 m, while the eastern one, having a maximum of five courses of bricks, is exposed up to a length of 45 m after which the wall takes a westerly turn which is exposed to a length of 4.5 m. The walls on either side of the platform were connected by brick-built water channels. The bricks used in the construction measure 27 X 17 X 7 cm.

Excavation in the north-west corner of the platform has brought to light a semi-circular brick structure, presumably a well, which has been partially exposed. Excavation on the southern side of the outer *gopura* revealed another brick wall oriented in east-west direction obviously of a later period as indicated by the brick size and nature of construction. This wall has a width of 0.90 m and is exposed to a length of 15 m.

During the course of excavation, noteworthy finds are architectural members such as sculptured pillars, *vyalavari*, *adhishthana* parts etc., stucco figures, various types of stone sculptures including that of Chamundi. Copper coins of the Chola period and a terracotta sealing depicting a warrior are the other finds.

UTTAR PRADESH

74. EXCAVATION AT FATFJIPUR SIKRI, DISTRICT AGRA.—In continuation of last's work *{1985-86,* pp. 71 -75) excavation at Fatehpur Sikri was resumed by the Agra Circle of the Survey in collaboration with the Aligarh Muslim University. The work in the area taken up for excavation by the Survey was carried out under the direction of Shankar Nath assisted by P.B.S. Sengar, G.A. Qamar, C.P. Singh, Y.K. Sharma, Sushil Kumar Jain, B.B. Sur, Chiranji Lai and B.P. Srivastava. The team from the Aligarh Muslim University carried out excavations under the direction of R.C. Gaur assisted by J.M. Siddiqui, Makkhan Lai, Mohd. Abid, Zahid Hashmi, Zameer Ahmad, Ghulam Mujtaba, Tahir AH Khan, Faziur Rahman and Mohd. Taskeen.

The Survey concentrated excavation at FPS-1 with the objectives to expose structures in the area lying to the west of western wall of Horse and Camel stables. The area has been divided into two parts by a modern *kliaranja* pathway leading from Badshahi Gate to Hathi Pole.

Excavation was taken up in the area to the west or the modern *kharanja* pathway and to the north of the Abul Fazal's Hammam in which last year nine rooms of a residential complex were partly exposed. It revealed two residential complexes separated by a narrow gallery (29-60 m x 2-46 m) and encompassed by walls on the four sides.

In the northern complex to the gallery, three rectangular rooms were exposed adjacent to the nine rooms partly exposed last year. These three rooms which are in a row were found interconnected through a narrow passage (1.6 m wide). The walls of these rooms had niches (1.10 m wide). The larger room had three entrances on the northern side opening to the adjacent rectangular room (measuring 7.30 X 3.40 m). The latter one had an entrance gate (1 m wide) at the eastern side. The larger one had another gate at the southern side opening to the courtyard in front of it. To the east of this courtyard, a set of four rooms standing in a row were exposed. All of them are rectangular in plan but vary in dimension. The northern room has an entrance gate, opening to the courtyard; the remaining three are interconnected through a passage (1.10 m wide). The side rooms have entrances of equal width (1.10 m wide) at the west side. The southern room has another gate that has an entry from the east side. To the west of it, another apartment with a courtyard was also laid bare. It has two rooms (3.50 X 2.7 m and 3.50 X 6.5 m) and in between a *dalan* (3.60 X 7.50 m). Each room has two entrances, one opening to the *dalan* and the other to the platform. The outside of the platform was found edged on with rectangular red sandstones. The *dalan* perhaps had flat roof of stone slabs, carried on stone pillars; the bases of the pillars were found *in situ.* The entry to this residential complex was from the entrance gate (1.10 m wide), exposed at the eastern end of the gallery.

The southern complex to the gallery has a courtyard (20.50 X 4.50 m) and two rooms (7.25 X 5.50 m each). To the west of the courtyard a platform 7 cm high with a flight of two steps was brought to light. The entrances to these rooms could not be traced due to heavy damage in the structures. It seems that there was open space (9.40 X 4.5 m) between the gallery and platform. To the west of this open space a room (2.95 X 4.50 m) and a small platform (1 .25 X 0.70 m) were also exposed. The platform is made of lime mixed with *kankar.* The entrance gate of this room (1.10 m wide) opens on to the open space. It might have been used as a bath room confirmed by a drain made of lime and *kankar* that carried the

refuse water to the gallery. To the north of the open space another small room (300 X 3.45 m) was exposed. The entry to this room was from the courtyard through a 80 cm wide entrance gate. The room was probably used as a store. At a distance of 5 metres from this room a set of two rooms (3.05 X 1.85 m) each were exposed. Entry to these rooms were also from the large courtyard. In these rooms, many miniature cells made of *lakhauri* bricks (5 X 25 X 25 cm) were exposed in series along the walls. The function of these rooms is unknown. They were probably used as bathrooms of radiating heat system. Floors of the rooms are made up with fine lime plaster and walls are coated with the same variety of material. At the back of these rooms a small gallery (80 cm wide) was exposed, which connects the open space with the large courtyard. Adjoining the large courtyard, a platform was also laid bare. This platform was attached to the hammam exposed last year. A flight of two steps (120 X 70 X 28 cm) attached with this platform was also exposed. In the large courtyard adjoining the platform, a small apartment (1.65 X 1.55 m) was also brought to light. It is made *of lakhauri* brick and provided with a gateway (60 X 25 cms) that opens on to the courtyard. This apartment has also several miniature cells made of *lakhauri* bricks which appears to have been used as a bathroom of radiating heat system. At the back of this apartment a platform (50.00 X 5.00 m) was exposed. A big water jar was found kept on this platform. Near the water jar and below the platform a vase was found buried in the gallery. This vase was probably used to collect the refuse water from a channel made of lime, that was exposed to collect the refuse water from a channel made of lime, that was exposed nearby. A large platform (11.25 X 2.95 m) adjoining the eastern boundary wall of the enclosure of the two complexes was exposed. It is edged on with stone slabs. In the southern residential complex a small gallery (1.40 m wide) was found running between this platform and the enclosure wall of the larger courtyard. It connects the gallery with latrine blocks exposed in the southern side in the southern complex. Nine pillars made of stone and lime mortar, attached with the eastern part of this platform were also exposed. These pillars were probably once carrying on a water channel running from the Hathi Pole to the complex of Abul Fazal and Faizi houses.

All these structures were built of undressed stones. The thickness of walls of these structures varies from 1 m to 1 .60 m and the plaster on walls varies from 3 cm to 9 cm. Floors are generally made of lime mixed with *kankar* and covered with a thin layer of fine lime plaster to provide smooth surface to it.

Ceramics include Chinese porcelain, glazed and red pottery. Some sherds of Chinese porcelain bear inscriptions in Chinese script. The prominent shapes are vases, large dishes, bowl, *chilams* and large storage jars. The antiquities included glass bangles, nails, chisel, inscribed brass seal and Mughal copper coins.

The team from Aligarh Muslim University under the direction of R.C. Gaur resumed excavation outside the so called Samosa Mahal in the northern ridge. The excavation revealed a big house complex (65 X 50 m). Two sets of rooms measuring 3.62 X 300 m and 3.00 X 2.5 m separated by a wall were also exposed. It was joined by a third room running north-south measuring 5-80 X 4.00 m. The outer row started beyond the wall on the eastern side with a room of 3.52 X 2.60 m to which is a projected circular cell with a diameter of 2.40 m. It is attached by a verandah (5.60 X 2.42 m) with pillars towards north. Then there were four rooms varying in size between 2.12 and 4.22 m and a gallery (5.50 X 2.5 m) which provided a passage to the latrines on the eastern end.

Another set of six rooms run north-south beyond the gallery. Though their width was almost the same (2.85 m), the length varies between 2.70 m and 400 m.

There were other structures on the northern side forming another group of rooms. The structures were very much damaged. Only one room measuring 4 X 3.8 m could be exposed. A flight of steps running towards north beyond these structures was also exposed. Many more structures were gradually coming to light at the lower where the steps level end.

As already reported, a set of six rooms attached to the outer western wall end running in south-north direction were traced. Out of them.three rooms were almost of same size measuring 4-65 x 3-90 m while the other three rooms on the southern side were bigger in length but almost of identical measurement of about 600 m. On the northern side, these rooms were followed by a 1.70 m wide gallery, a corner room looking like a rhombus and a room (5.4 X 3.77 m) touching the outer wall of an extant hammam. The hammam was followed further by a room (5.20 X 3.30 m). The remains of a long but narrow pillared verandah were also exposed.

Excavation was further resumed in the main complex measuring 127.10 m east-west and 67.80 m north-south covering an area of about 8617.38 sq m and remains of room lying between the tank attached to the main wall behind the great mosque and running east-west and the structures attached to the outer wall running north-south were exposed. During this season as many as five rooms were exposed. These rooms vary in size having length between 2.90 m and 5.00 m. The width was generally 3.30 m. Several rooms in a row were also exposed along the outer wall of the Samosa Mahal running roughly in north-west south-east direction. The whole complex including Samosa Mahal appeared to be an extension of the royal harmsara.

Excavation was also undertaken to complete already partly excavated house complex adjacent to royal stables and Cheetah Khana situated below the ridge on the northern side, not far away from the Hauz-i-shirin. This year, part of a house complex was exposed consisting of room, platform and cisterns. On the eastern side of the courtyard of this house a very interesting set of twelve circular flower beds were found. Their diameters vary between 1.10 m and 0.82 m.

The excavation also yielded interesting pottery pieces, objects of terracotta, stone and iron. A few coins were also found including those of Jahangir.

75. EXPLORATIONS IN DISTRICT ALMORA.—Under the village to village survey scheme the U.P. State Archaeological Organization explored the region around Gagas river, a tributary of Ram-Ganga and brought to light ancient group of temples assignable between eleventh and seventeenth centuries in the village of Sakuni near Bagwali Pokhar. Images of Uma-Maheswara, Parvati, Mahisasuramardini, Surya, Vishnu and Ganesa all datable between the seventh and seventeenth centuries were noticed in the courtyard and also in the sanctum of the temples. The images of Parvati, Hari-Hara, Sarasvati and Saptmatrika panel/etc, were found in the villages of Petsal, Paner, Rewari, Naulakot, Parkot, Basulisera, Pokhar and Melta in the vicinity of Bagwali Pokhar near Dwarahat.

76. EXCAVATION AT SRAVASTI, DISTRICT BAHRAICH.—The Excavation Branch III of the Survey in collaboration with the Kansai Univesrity, Suita, Osaka, Japan, under the direction of B.S. Raman and Yoshinori Aboshi, assisted by B. Bandyopadhyaya, A. Jha, S. Maity, A.C. Chakravarty, I .M. Tikoo, Kishan Singh, S.K. Gupta and D.K. Ambastha of the Survey and Fumitaka Takuya Yamaguchi, Masashi Tokuda, Hideki Kurogane, Akira Oshita and Nobuaki Tsuchie of the University carried out excavations at the Jetavana site of Sahet-Mahet (ancient Sravasti) with the objective to ascertain the cultural potentiality of the site.

The excavation was conducted on the southern and north-western periphery of the mound. On the basis of pottery and antiquities, the history of the site can be divided into two cultural periods : Period I is Sunga-Kushana *(circa* first century BC to first century AD) and period II is early Gupta to post-Gupta *(circa* third to sixth-seventh century AD).

In the course of excavations, forty-one structures of burnt brick, mostly remains of walls and cells were located on the southern area of the mound. Six successive phases of constructional activities were also observed. Most of the structures, particularly the walls, were raised on prepared surface of levelled-clay/compact earth without any foundation ; the successive structures have been built one above the other using the earlier ones as foundation. Evidence of brick-paved floors was also noticed in some of the trenches. A few burnt clay structures, semi-elliptical in shape, were found in three trenches, the purpose of which is yet to be established. An important find was an inscribed terracotta sealing with the Buddhist formula `*Ye Dharma hetu"* etc., in Sanskrit language and post-Gupta Brahmi characters assignable to *circa* fifth-sixth century AD.

In the trench falling on the north- western area of the mound, a burnt brick structure, running north-south and east-west with a corner was exposed. The bricks measure 0.35 X 0.30 X 0.05 m. The structure is one metre in height and had eighteen courses of bricks. The breadth of the wall at the top is 1.05 m. A paved apron-like floor was also exposed adjoining the walls of the structure on their eastern and southern faces at the bottom.

Pottery of period I was the Sunga-Kushana red were. The shapes include vase, bowl, lid-cum-bowl, storage jar, basin and sprinkler. The pottery of period II was also predominantly red ware of the post-Gupta period. The shapes represented include bowl, dish, vase, trough and storage jar.

Antiquities recovered from period I include terracotta dabbers, decorated moulds, animal figurines, stamps besides a few iron nails and lumps. Antiquities represented in period II include terracotta human and animal figurines, gamesmen, a solitary inscribed sealing as mentioned above and dabber beads of terracotta and semi-precious stone, iron nail and lump, fragment of glass and shell bangles.

77. EXPLORATIONS IN DISTRICT CHAMOLI.—The Regional Archaeological Unit, Pauri Garhwal, of the Uttar Pradesh State Archaeological Organization underG.C. Singh, assisted by B.P. Badoni carried out exploration in Ghat block (Mandakini Ghati) and brought to light thirteen early medieval and medieval temples. Among them, the temples located at Kahali, Shubhadini, Phegu, Manigram, Lamagauri, Saikot, Maithana, Lungatara and Markhi are important. Besides these temples, the stone sculptures of Vishnu,- Lakshmi-Narayana, Seshasayi Vishnu, Siva, Uma-Mahesvara, Vinadhara Siva,

Paryati, Surya, Mahishasuramardini, Ganga, Chamunda, Navagrahas, Ganesa, Ekamukha *Siva-linga,* Karttikeya, panel of Ganesa, Lakshmi and Kubera are also important.

The beautiful image of Ganga explored from Bheti village is of special mention. The deity measuring 20 cm is depicted in *tribhanga* pose, holding lotus stalk in her right hand and the left hand resting on an attendant.

One more important site of the Kushana period was located at Bairaskund. The ceramics collected from this site include red wares, terracotta bangles and bricks.

78. EXCAVATION AT JAKHERA, DISTRICT ETAH.— In continuation of the last season's work *(1985-86,* pp. 79-81), the Department of History, Aligarh Muslim University, resumed excavation at the site under the direction of M.D.N Sahi, assisted by Naheed Khan, P.P. Bose, Rakesh Kumar and Mala Seth. Technical assistance was rendered by S. Saeedul Hasan, N.H. Zaidi, Anis Alvi, Zameer Ahmad and Ramjit.

The main objective of this year's work was to expose house plans of the PGW levels and to trace further the alignment, depth and the width of the Channel no. 2 discovered last year running north-south on the western fringe of JKH-I and to trace its correlation with the Channel no. 1 of the PGW period reported earlier *(1975-76,* pp. 50-51). In all seven trenches were laid, five on JKH -I and two on JKH-II each measuring 10 X 10 metres.

Channel 2 was found extending further south along the same alignment. Its average width appears to be more than ten metres. Though its bottom could not be reached, it apears that it had three overlapping phases of its own. On the western edge of this channel a dump almost running parallel to it was also found. It also appears that Channel no. 1 belonging to the PGW phase either merged or was totally engulfed by Channel no.2 on the western fringe of JKH-I.

In trench G-7 an oval mud structure with two successive floors was exposed. It was assignable to the early phase of the NBP ware (period I). In trench Dd-4 mud wall running NE-SW and belonging to the late phase of PGW (period IIIB) was exposed. It was disturbed at both the ends; so its total length could not therefore be traced. However, this piece of evidence clearly indicates that during the mature PGW period structures with straight walls were also in existence simultaneously. In a corner of SW quadrant of the same trench a part of wattle-and-daub structure with intact post-holes of burnt clay was found. Bamboo charcoal inside the post-holes was also noticed. A floor studded with pottery pieces horizontally laid in mosaic form reported earlier in trenches D-3 and E-3 was found extending in trenches D-4, E-4 and F-4 excavated this year. Immediately overlying this pottery floor was found a band of fine silt and sand. It appears that the horizontality of the pottery pieces and the deposit of silt and sand was the result of an intense flood during the early phase of the PGW period. Interestingly enough, this deposit was not traceable within the confines of the house plans. A long drain belonging to the post-flood phase of the PGW period was found running from NE to SW direction and jiltimately joining the Channel no.l which was apparently engulfed by Channel no.2 . This *kachcha* drain was traced passing through trenches C-2, D-2, D-3, roughly covering a distance of about 30 metres. Though its beginning was not known, its end was well ascertained.

On JKH-II, it is interesting to note that a pan of a circular mud house was traced quite close to the two circular mud houses reported last year. It appears that probably all these three circular/oval mud houses or structures were pans of the same residential complex, as the intervening space between them is almost negligible. On the extant top of the walls post-holes were found at regular intervals. In most of the trenches many flimsy floors with overlapping post-holes and burnt patches of the floors indicate hectic structural activity. It may however be noted that very few antiquities were recovered from the floors of the houses. Most of the antiquities were usually recovered from the area lying outside.

Among the antiquities recovered this year from the deposits of the mature PGW levels (period IIIB) the significant ones are two gold objects, and two tiny gold foils. The two gold objects are a wire and a leaf-shaped ornament piece (?). It may be recalled here that a flat spiral ear/nose ring was found last year. Among other objects found from the same deposit were pieces of pestles and querns, balls, weights and sharpners of sand stone; lumps of quartz and jasper, arrowheads, hoe, nails, sickle piece, hooks, rod, knife and spearheads besides slags and lumps of iron; beads of glass, jasper, agate and carnelian; rod, wire, ear ornaments (?) and ring of copper; points, beads, arrowheads and various unfinished objects of bone besides sawn antlers of various sizes. Terracotta objects include beads, gamesmen, human figurine, discs with incised decoration and wheels. Two terracotta discs however were found painted with black pigment.

From the NBP ware levels few antiquities of sandstone, glass, precious stones, bones andjerracotta were found, important ones being semi-precious stone beads, antimony rod, vessel piece, ring and bangles of copper and violin, shaped terracotta human figurines.

79. EXPLORATION IN DISTRICT ETAWAH.— During the course of village-to-village survey in Tehsil Bharthna, Suresh Singh of the Agra Circle of the Survey discovered the following sites with antiquarian remains of diffeent periods :

Village/Site	*Nature of remains*
Aghaini	Eighteenth century Rohilla fortress
Birari	Siva and Devi temples of eighteenth century
Kurkha	Mound yielding red and black-slipped ware and Kurkha Devi temple of medieval period.
Mohri	Mound with red and grey ware of Sunga-Kushana period
Puriala	Rama temple datable to eighteenth century
Rataur	Chamundi devi temple datable toieighteenth century
Sainfi	Mound with NBP, black-slipped and red wares
Sarsai Nawar	Hazari Mahadeva temple datable to seventeenth century
Sothna	Chauhan fortress

80. EXCAVATION ATNARIIAN, DISTRICT GORAKHPUR.—In continuation of the last year's work *(1985-86,* pp. 81-82), the Department of Ancient Indian History .Culture and Archaeology, Banaras Hindu University, under the direction of Purushottam Singh, assisted by Ashok Kumar Singh and Indrajeet Singh resumed the excavation on Mound-1 to know in detail the settlement pattern and life-style of the inhabitants of Period I and II.

The earliest inhabitants, represented by 1 m thick deposit of chalcolithic (Period 1), lived in wattle-and daub houses indicated by a large number of burnt lumps of clay and post-holes. Other structural details comprised several hearths and two potter's kilns. A large floor made of clay mixed with potsherds was noticed in area of roughly 13.5 X 5 square metres. However, the complete house plan could not be reconstructed because of limited area of the dig. The ceramic industry of period I comprised of white painted black-and-red ware in fine, medium and coarse fabrics, black-slipped ware with occasional linear paintings in white, red-slipped ware and coarse red ware. A few sherds of burnished black-and-red ware were encountered from this level for the first time. The shapes in this ware included channel-spouted bowls comparable with those of Pandu Rajar Dhibi and Chirand, pedestal bowls and lipped basins. The characteristic shapes of red-slipped ware are the large basin with sharp carination atthe base and footed vessel with perforated bottom. In the black-and-red ware the paintings, essentially linear, were executed in the interior of the pots and in some cases on the exterior as well. In the latter case the paintings were confined only to the rim portion of the pots.

In the lithic component the discovery of a solitary polished stone was a noteworthy find besides some stray pieces and fragments of stone. Other small finds are arrowheads, both socketed and tanged, and points of bone and pottery discs in large number.

Period II was essentially the same as in the preceding period except a marked change in the ceramic industry and introduction of iron in limited quantity. The principal ceramic industry is black-slipped ware whereas the other two ceramic industries of the preceding period, viz., black-and-red ware and red-slipped ware were totally absent in this period. Among the notable pottery of the current field season was the NBP ware in limited quantity from Mound-1. However, the duration of NBP ware deposit was very brief and Mound-1 was deserted thereafter. It may be noted that the later shapes of NBP ware like the carinated *handi* (Ahichchhatra 10 A) and other associated shapes are totally absent from period II. Thus, it is now clear that the settlement of Mound-1 was deserted around 450 BC probably because of the menace of river Ghaghara and the inhabitants moved to safer places like Amauli and Chandihar villages, located to the west and north-east of Mound-1 respectively.

81. EXCAVATION AT HULASKHERA, DISTRICT LUCKNOW.—In continuation of the previous year's *(1985-86*, p. 82) work, the Uttar Pradesh State Archaeological Organization resumed excavations at Hulaskhera under the direction of Rakesh Tiwari and Rakesh Kumar Srivastava with a view to unearth the remaining portions of the earlier exposed structures and to correlate them with each other.

In the earlier phase of the Kushana period about 2 m broad passage, connected with by-lanes, was left between the two housing complexes. The rooms were large with well-laid floors of baked bricks or rammed clay. In the second phase, this passage was utilized to construct some more rooms to provide more accommodation. It has also been observed that the larger rooms of the earlier phase were

converted into two smaller rooms by raising a dividing wall. Besides, there was an increase in the number of sherds, tiles and storage jars accommodated in the comers of the rooms. Samples of rice, wheat, gram and other cereals were found *in situ* in the storage jars, the pits and on the floors.

It was confirmed, through this season's work, that the structure (made up of several steps of kiln-burnt bricks) exposed in the previous excavation had been provided to strengthen the broad north-east wall of a house complex. However, in the latter phase of the Kushana period, the residents were chiefly concerned with more accommodation and they were probably not aware of the significance of the revetment. Hence walls were raised without considering the slope and they fell down in a short span of time, which is evident from the excavation.

The pottery types found in this year's excavation are almost similar to the previous findings, a handled *karahi* and a few finely-decorated bowls belonging to the Kushana and Gupta periods respectively are some new additions to the pottery-types.

Among the other noteworthy findings, mention may be made of a handle of a water vessel, decorated by a beautiful carved female figurine with folded hands, a terracotta human head with prominent applied moustaches and a conical headgear from early Kushana layers.

82. EXPLORATION IN DISTRICT MUZAFFARNAGAR.—In the course of village-to-village survey, R.C. Gaur and Makkhan Lai, assisted by Gulam Mujtaba, Mohd Abid and Faizur Rahman of Centre of Advanced Study, Department of History, Aligarh Muslim University, noticed the following sites in the Tehsils of Budhaun and Kairana.

Site/locality	*Nature of remains*
Dungar (29° 21'; 77° 21')	Late Harappan and Ochre coloured pottery
Durganpur (29° 11'; 77° 21')	PGW, black-slipped ware and NBP ware
Jaula (29° 17'; 77° 25')	PGW, NBP and Kushana ware
Jhal (29° 24'; 77° 20')	PGW
Khanpur (29° 20'; 77? 28')	Kushana and Gupta
Khera (29° 13'; 77° 35')	PGW and black-slipped ware
Huzur Nagar (20° 19'; 77° 40')	PGW and NBP ware
Pura BalianaX29°8'; 77° 39')	PGW, NBP ware, Kushana and medieval
Shikarpur (29° 23'; 77° 39')	Ochre coloured pottery
Toda (29° 17'; 77° 32')	Ochre coloured pottery, PGW and Kushana

83. EXPLORATION IN DISTRICTS NAINITAL AND RAMPUR.— Shibendra Singh Adhikari, research scholar in the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, with the assistance of Pradeep Kumar Behra, explored Haldwani, Kashipur and Kichha Tehsils of the District Nainital and Suar tehsil of the District Rampur and discovered sites of archaeological interest. The work was carried out under the supervision of P.C. Pant.

Tehsil	*Site/village*	*Nature of remains*
Tehsil	*District Nainital*	
Haldwani	Rajpal Mandir	Grey and red wares and sculptures
Kashipur	Amdanda	Architectural panel
-do-	Bans Khera	Grey, red-slipped, black-slipped and red wares and *lakhauri* bricks
-do-	Barah No. Ki Chowki	Grey, black and red wares
-do-	Barkheri Pandav	Grey, red-slipped and red wares
-do-	Barkhera Pande-I	Red, red-slipped and grey wares
-do-	Barkhera Pande-II	Grey, red, red-slipped and black-slipped wares
-do-	Bharatpur	Black-and-red, red-slipped and red wares Red,
-do-	Bukshora	black and red and red-slipped wares
-do-	Chapat	Red-slipped, black-and-red and red wares
-do-	Dhani River Bank	Grey, red-slipped and red wares
-do-	Dhikuli (Viratha Nagar)	Grey, red-slipped and red wares and architectural pieces
-do-	Dhima Khera	PGW, red-slipped, red, black-and-red and black-slipped wares and terracotta animal
-do-	Durgapur	figurines Red-slipped and red-wares
-do-	Garal Kantheshwar Mahadev	Icons of Siva, Ganesa and a bearded god
-do-	Garhiganj	Red ware
-do-	Garhi Negi	Red-slipped and red wares
-do-	Girdiya Munshi	Red-slipped and red wares
-do-	Jaspur	Medieval structure
-do-	Karanpur	Red-slipped and red wares
-do-	Kashipur	PGW, grey, red.red-slipped, black-and red wares and brick structures
-do-	Kharakpur-I	Grey, red and red-slipped wares
-do-	Kharakpur-II (Debipura)	Grey, red and red-slipped wares
-do-	Kharakpur-III	PGW, grey, black-and -red, red and red-slipped wares
-do-	Khokhara Devi	Grey, red, red-slipped and black-and-red wares
-do-	Kishanpur-I	Red and red-slipped wares
-do-	Kishanpur-II	Grey, red-slipped, red, black-slipped and black-and-red wares
-do-	Kunda ki Mandhaian	Red-slipped and red wares

Tehsil	*Site/village*	*Nature of remains*
Kashipur	Mahua Kheraganj	Red-slipped ware
-do-	Maldhan	Red-slipped and red wares
-do-	Pastara	Red-slipped and red wares
-do-	Rajpura Rani	Grey, red-slipped, black-and-red and red wares
-do-	Rajpur Barkheri	Red-slipped, black-and -red and red wares and medieval well
-do-	SandKhera	Grey, red-slipped, black-and-red, black-slipped and red wares
-do-	Sarwar Khera	Red, red-slipped, black-and-red wares
-do-	Sheorajpur	PGW, grey, red, black-slipped, red-slipped and black-and-red wares
-do-	Sitabani	Icons of Siva-Parvati, *Siva-linga* and architectural members
-do-	Terha Gaon	Architectural panels, icons of Ganesa and an unknown male, a votive temple and inscription on small panel
Kichha	. Gori Kanla	Red-slipped and red wares
-do-	Juriyapir	Black-and-red, red-slipped and red wares and well
-do-	Kanaura	Black-and -red, red-slipped and red wares and iron slag'and medieval structure
-do-	Masjid	Red-slipped and red wares
-do-	Mohan Borang	Red-slipped and red wares
-do-	Shantipuri No. 4	Red ware and well
	District Rampur	
Suar	Dhoushipura	Black-and-red, red-slipped and red wares and medieval well

84. EXPLORATIONS IN DISTRICT PAURI GARHWAL.—The Regional Arhaeological Unit, Pauri Garhwal, of the Uttar Pradesh Archaeological Organization, carried out exploration of antiquarian remains of Tehsil Thalisen and other areas, under G.C. Singh assisted by B.P. Badoni and B.S. Rawat brought to light two temples of Vallabhi style and eight temples of Nagara style as cribable between early medieval and medieval period, historical sites and other important sculptures. The Vallabhi style temples have been located at Burabharsar and Narayan Dhunga; the Nagara style temples at Dhamakeswar Dhunarghat, Danri, Devaleshwar and Khola.

Stone sculptures of the early medieval to medieval period were noticed in the village of Matleshwar, Dyurani, Bhagvati Talaiya, Pajyana, Shaikaleshwar, Thangoan, Jaiti, Dhamkeshwar,

Khola, Danri, and Devleshwar. One Bhagaditya image located at Khola is a rare find. It measres 0.72 X 0.36 cm. An image of Mahishasuramardini Durga containing inscription in Brahmi and two inscriptions in Sankha-lipi were noticed at Binsar Mahadeva temple.

Historical sites have been located at Devleshwar, BhagvatiTalaiyaand Koteshwar. The collection includes red ware and brick structure of early medieval period.

85.EXPLORATION IN DISTRICT PITHORAGARH.—In continuatioin of the previous year's work (1985-*86,* pp. 82-83), Hem Raj of the Regional Archaeological Unit, Almora, of the Uttar Pradesh State Archaeological Organization resumed exploration under village-to-village survey scheme in Tehsil Champawat. A covered water-spring *(naula*) belonging to late medieval period was noticed at the village of Pafan near Lohaghat. The interior walls of the *naula* were richly decorated with carvings. The designs included replicas of temples, warriors, elephants, lions, honeysuckle and a number of different scenes. Stone images of Seshasayi Vishnu, Mahishasuramardini, Ganesa and Surya dated to medieval period were found at the village of Kolidhek, Pau and Kuldev.

86. EXCAVATION AT DAMDAMA, DISTRICT PRATAPGARH.—In continuation of previous year's (1985-*86,* pp. 83-84) work; th6 Department of Ancient History, Culture and Arhaeology, University of Allahabad, under the direction of V.D. Misra, J.N. Pandcy and J.N. Pal, assisted by D.K. Shukla, M.C. Gupta, H.N. Kar, L.K. Tewari, V.N. Rai, Rajendra Prasad, V.K. Khatri and Sanjay Kumar resumed excavation at the mesolithic site of Damdama with the objective to know the exact nature of exposed circular burnt floors and to correlate the stratigraphic position of the area.

The excavation revaled two hut floors, nineteen graves and burnt floors along with a large number of artefacts.

The first exposed floor was located to the south of the previously excavated area. The floor is sloping towards the periphery. The circular floor measured 5.35 m in the north-south axis while its east-west axis measured 5.30m. Microliths, quems and mullers, burnt clay lumps and animal bone fragments were found scattered on the floor. Complete mullers were found to the south and south-west of the floor. Excavation of the floor revealed the evidence of burying the dead within the floor. Four graves of two phases were found just below this floor. At places, the floor had clear evidence of burnt plaster.

The second floor located in the northern part of the excavated area is marked by multiple layers of burnt-red plaster. Small fragments of highly charred animal bones, microliths, a bone arrowhead and quern fragments were also recorded *in situ* from the floor. The floor was elliptical in shape and sloping towards the periphery. Its longer axis running north-west to south-east measured 5.63 m and shorter axis measured 4.20 m. As many as 5 post-holes around the periphery of the floor were located.

Besides the floors a good number of pit hearths and burnt plaster were also exposed. Of these, a cluster of hearths and burnt plaster, sealed by layer 4 revealed near a flexed burial, are noteworthy.

Hearth A measuring (85 X 80 cm), full of burnt and semi-bumt clay lumps and small charred bones, was circular on plan. The hearth B was almost rectangular in shape and it measured 56 X 40 cm. Hearth C was elliptical in shape and measured 133 X 60 cm. Significantly, the sides of the hearths were plastered. The average depth of the hearths was 20 cm.

A cluster of four burnt flat plasters in the vicinity of these hearths was also located. On the basis of overlapping these plasters.elliptical in shape, may be divided into four different phases.

In all nineteen graves were exposed during the year. Of these one (grave XXXVIII) belongs to second phase, one (grave XI) to third phase, one (grave XXVII) to seventh phase, six (graves XXX, XXXII, XXXVI, XXXVII and XXXIX) to eighth phase and ten (grave XXXIII to XXVII, XXIX, XXI XXXIV, XXV and XLI) belong *td* the ninth or the last phase. As revealed in previous excavations, this season's excavation also presented the evidence of shallow oblong grave pits in which the skeletons have been found in extended supine position. The graves which presented remarkable features are grave XXVIII having a flexed burial and graves XXX and XXXVI both having double burial. One of the burials yielded a big-sized bone arrowhead placed below the right leg of one of the skeletons. Most of the skeletons, except those found in southern area, are west-east oriented, the head lying towards the west. All the four skeletons, exposed within the first floors and one very near to this floor, are oriented north-east to south-east, head pointing the north-east.

The excavation yielded a good number of charred and semi-charred animal bones. Microliths, bone arrowheads, haematite rubbed pieces, fragments of querns, mullers-cum-anvils and hammer stones are the other artefacts recovered *in situ* during excavation. Special mention may be made of a pointed conical arrowhead of red sandstone found near the head of grave XXXVII, and cluster of seven unused unrubbed bright red coloured haematite pieces placed together near the foot of grave XL.

M.D. Kajale of the Deccan College, Postgraduate and Research Institute, Pune, and K.S. Saraswat of Birbal Sahni Institute of Palaeobotany, Lucknow, also participated in the excavation and collected botanical remain s by floatation techinque. One trial trench of 1 -5 x 1 -5 m was laid in the lake at a distance of 123 m to study the lake sediments. The present lake bed is 3-48 m below the datum. The excavation . revealed that during the last phase of the mesolithic period the level of the lake bed was 4.48 m below the datum while in the earliest phase it was 5-14 m below the datum.

87. EXPLORATION IN DISTRICT SULTANPUR.—M.C. Joshi and J.S. Nigam of the Survey examined nearly a dozen sites including the mound known as Garha, around the Sultanpur town on a request from Shiv Prasad Singh of the District Youth Congress, Sultanpur.

The site Garh or Garha, located at a distance of about 17 km from Sultanpur on the left bank of the river Gomati near the tiny township of Kurwar, is an extensive mound with considerable archaeological deposit covering an area of about 2 to 3 km, the large part of which is under cultivation and considerable portion seems to have been eroded by river Gomati. It still preserves ruins of ancient structures especially of baked bricks of diverse sizes belonging to different periods. Of the brick remains, perhaps most ineresting is a long wall nearly 2.50 m wide which is most likely some kind of fortification wall signifying the name of the site as Garh (fort or castle).

The pottery found at Garha consists of black-slipped ware, NBP ware and associated ceramic types, besides sherds of red ware and medieval glazed pottery. On the basis of ceramic types, especially in black-slipped and NBP wares, though largely of an inferior variety, the earliest habitation of this site can be dated to the middle of first millennium BC. The brick remains seem to belong to subsequent period. Occurrence of glazed ware at Garha is associated with the period of Muslim occupation in the

area some time after the twelfth century AD. No sculpture was found at the site but it is stated that some images have been removed to nearby villages and elsewhere in the past.

The village Ahiran-ki-Palia, is situated near Musafirkhana about 34 km to the west of the district headquarters. Outside the village is a low mound, strewn with bricks and brickbats and containing three lately built structures of which one is a modern shrine of Hanuman and other two are in a deserted state.

The so-called Hanuman shrine which is in the form of a shed with three sides open, has three important sculptures and several carved fragments of stone. Of these, the main one (height 1.80 m), placed centrally against the back wall, represents Surya (pl. XXXIV A) in his usual dress consisting of long coat, scarf *(uttariya),* armour and boots and ornaments like crown, necklace, ear-drops, armlets, etc., is being worshipped as Hanuman. He holds a rosary in his right hand and his'left hand is in *vyakhyana-mudra.* An unusual feature of this image is absence of attendants in the lower plane who are replaced by a lotus with stalk on either side. Stylistically, the image may be dated to late tenth century AD. Perhaps the sculpture depicts Surya as a divine teacher *{guru*).

The other two images include an obliterated figure of Vishnu in its upper half (height 65 cm) and a Siva-Parvati (pl. XXXIVB) with *Vidyadharas* (height 50 cm) of about the same date as the icon of Surya.

Equally interesting here are two partly extant (1.58 m in height) well-carved door-jambs of sandstone fixed on the front of Hanuman temple as pillars. Datable to *circa* tenth or eleventh century on stylistic ground, these jambs bear a faceted character ornamented with scrolled creepers, jar and foliage motif, *kirti-mukha* with a suspended chain, amorous couples; floral-garland and river goddesses with attendants. An old doorsill, part of a carved beam and a pilaster, once belonging to some medieval temple lie outside the modern shrine. Fragments of ancient sculptures including figures of musicians relieved in a panel, lower half of a Surya image, upper part of a door-frame, a ceiling slab and small ornamental stones are fixed on the walls of other two structures which also seem to have been constructed as shrines slightly before the Hanuman temple.

The bricks lying at Ahiran-ki-Palia suggest that originally the site had more than one temple made of brick as well as stone which were dedicated to Surya and other divinities detable between the post-Gupta period and eleventh century AD.

Close to Kurwar the village of Kalu Pathak-ka-Purwa is almost at'a distance of 12 km north of Sultanpur. It also has a low mound topped by an incomplete quadrilateral enclosure of modern bricks wherein a large but somewhat damaged figure of standing Surya (pl. XXXV A), is enshrined under the local name of Bhagit-Baba (height 1.66 m). This Surya image which may date in early tenth century, was perhaps more elaborately carved than the one at Ahiran-ki-Palia but a large portion of its frame, hands of the god, faces of female attendants and figure of Aruna are either lost or damaged. A beam fragment of stone with carved decoration on the frontal side is being used as a sill in this shrine.

Part of the enclosure seems to represent some older temple in brick which perhaps once stood on the elevated ground with a tank on one side.

One kilometre from Kalu Pathak-ka-Purwa is Sohgauli where within a newly-built kiosk is installed a plain *Siva-linga* with the damaged top belonging to the medieval period.

The village of Miranpur lies 11 km to the west of Sultanpur and has inside a recently-raised kiosk-like shrine containing an interesting *ekamukha linga* with a bust of Siva (78 cm) wearing an ornate turban with a crescent moon. Stylistically, the *linga* may be dated to the eighth or ninth century AD. There is also a plain *linga* and gargoyle *(pranala)* enshrined within this structure. These images arc stated to have been lately transferred from some other locality nearby.

Almost 18 km to the west of the district headquarters Sanichare village preserves the remains of an important but a small temple in the form of huge heap of burnt bricks covered largely with vegetation. However, exterior basal wall, partly exposed on one side, and partly extant plan (2.15 m square internally) of sanctum located centrally on the top suggest that structural remains at Sanichare originally represented a terraced temple of pyramidal form consisting of at least triple horizontal stages of elevation which could be dated to a period not later than the eighth century AD. It may not be out of place to mention here that the earliest temples of the terraced design have been discovered at Ahichchhatra in District Bareilly and dated to the Gupta period. This ruined shrine at Sanichare may be amongst a few surviving representatives of terraced temples of later period.

The main image (over a metre high), representing a two-armed Siva or Saivaite deity (pl. XXXV B and XXXVI A) with accessory figures of smaller size flanking him at base and top, installed centrally against the back wall of the sanctum seems to be *in situ.* It is a fine example of eighth century sculptural art with some traits of the Gupta style. On the two sides of the principal icons are somewhat smaller slabs bearing attractive reliefs of Vishnu and Surya which also seem to have originally belonged to this temple. A door sill with sculptured front depicting a conventional flower flanked by an elephant and a deity on crocodile and lion on either side is also lying below the base of the image. It is desirable to undertake a_ detailed study of-the ruinous structure for properly understanding.its original design. Locally, the temple is called the shrine of Thaken Baba.

Some 24 km from Sultanpur on the west lies the site of Koond near the village of Haji-Patti by the side of a tank called Sagra.

Old remains are located at two places viz., towards the west of the tank opposite Haji-Patti village and above the south-eastern edge of Sagra. The former represents an area covered with brickbats and highly runied structures besides some fragmentary medieval sculptures. It seems to mark either a temple site or a pre-Muslim residential complex.

On the other side of the tank are more interesting artistic relics within a high brickbuilt enclosure with a flight of steps raised most probably on temple ruins of successive periods as can be inferred from the broken architectural members, pieces of ornamental bricks and fragmentary sculptures used in the construction of the structural complex or lying inside it. The enclosure and shrine inside it appear to have been built in the last century or so but the whole structural complex has been renovated in recent years. Thus structurally there is nothing significant in this temple enclosure but some stone sculptures within it are undoubtedly important. The mairt shrine which is a domed structure built at a corner of the enclosure contains some fine images of about the eleventh century AD.

The main sculpture (84 cm in height), depicting a male and a female divinity, the later with a child in her lap seated under a tree resembling the contemporary image of the Jaina couple representing Gomedha and Ambika but on the top there is no figure of the Jina but a tiny bust of a certain deity, most

probably that of the Moon god, above the mark of crescent moon, with right hand in *varada* pose and left one holding a *kalasa.* The features make it a rendering of some uncommon type. The other images inside include two of Vishnu (1 .25 m high and 90 cm high) one seated on Garuda and another in standing position with *dasavataras* on the frame, and an unfinished Surya figure (1.32 m high) with other attendant divinities, besides a capital carved with *gana* reliefs.

Of the sculptures and other carved stones lying outside the principal temple chiefly consist of fragment of a pillar with *ghata-pallava* motif, a jamb with representation of river goddess, a gorgoyle, a standing male holding a staff, river-goddess Ganga (in upper half only), *Gana* - capital, and a top of beautiful *prabhavali* belonging to some Vishnu image of about the tenth century relieved with *dasavataras,* tiny figures of Siva, Brahma, etc.

To South-west of Sultanpur near Dhamaur lies Somnabhar or Narisinghan at a distance of 16 km frorn[1] the former. The site which once had temples, is covered with brickbats, heaps of bricks, traces of a few basal walls of ancient structures on one side of a large tank. It is not unlikely that these are the marks of some ancient temples.

In a modem hut shaped shrine at Somnabhar are fixed oa the walls of the interior four fine sculptures of stone datable to the eighth and ninth centuries AD which may have originally belonged to some temples occupying the site.

Of the four sculptures the largest one is an image of Surya in standing posture (height 1.10 m) holding as usual two lotus flowers and wearing crown and other common ornaments, *uttariya,* etc. The treatment of the figure bears marked heaviness, the crown looks like a longish cap of angular design tied with an ornate band at the base. Stylistically, the figure may be assigned a date in the eighth century AD. Somewhat smaller than the Surya image is a boldly relieved figure of standing Vishnu (height 80 cm) in usual form with only one hand extant.

Other two sculptures are in the form of carved panels representing Matrikas and Revanta (pl. XXXVIB), the son of Surya. The former in its present state (69 X 32 cm) depicts only *Vinadhara* Siva and three of the seven Matrikas, viz., Brahmi, Mahesvari and Kaumari, as the remaining part seems to have broken and lost in the past.

The best of the lot however is the sculpture (1 .5 m X 50 cm) representing Revanta centrally in the attire of a royal figure on horse back holding a wine cup hunting wild boars, with two other riders and seven attendants accompanied by dogs. One of his attendants carries a dead animal (boar), other holds an auspicious jar, a third one suppports the parasol and fourth blows a conch. In the upper part of the panel are carved planets, Lakshmi, Matrikas and Ganesa and below the main scene are depicted five attendant divinities, devotees (human) and musicians.

Bhanti is located close to a Dhamaur, nearly 20 km west of Sultanpur and has a medieval temple by the side of a tank now covered with fragments of burnt bricks wherein irregular traces of structural plans could be still detected. Presently, there are no sculptures but people from nearby villages are stated to have removed some images from the area in the past. A Siva-linga kept now a few hundred metres away from the site under a tree is stated to have been originally found at Bhanti within the old remains.

Situated about 10 km from Sultanpur on the Sultanpur-Rai Bareilly Road, the site Bhain is in the form of low mound within a small area. Some irregular remains of brick walls, brickbats and traces of'

a lime-floor below 75 cm from the existing ground level and pottery collected from here suggest that there was some kind of settlement of the medieval period. Only specimens of sculptural art at the site are an image of Vishnu of about the eleventh century kept under a trees and a small fragmentary piece of a sculpture lying nearby.

Situated about 14 km south-west of Sultanpur, Mahilowaspur has a modern shrine wherein a damaged temple doorframe and a door sill in two pieces of *circa* eleventh century AD are being worshipped as Hindu deities.

the jamb (1.88 m) is faceted and sculptured with scrolled decoration, *ghata-pallava* motif, attendant figures etc., like the one reused in the modern shrine at Ahiran-ki-Paliya. Its upper part is now missing.

The door-sill, which is in two broken parts, is relieved with the lions and divine figures flanking a central floral motif. Most probably these architectural pieces belonged to some large medieval temple which may have stood in the vicinity of the present village in the past.

At a short distance from Mahilowaspur is Mahmudpur wherein a brick temple dedicated to goddess Bhavani built in 1914 contains some sculptures in the sanctum and niches outside. The main images being worshipped as Bhavani is in fact a representation of a four-armed Parvati (height 65 cm) in standing position with two attendants but the whole surface is covered with a thick coat of vermilion. Stylistically it can be dated to *circa* eleventh century AD. Another image within the shrine is that of Vishnu in Trivikrama form (64 cm high) in bold relief with other accessory figures. The figure on the basis of style, can be dated slightly to an earlier date than the main image. Amongst the sculptures outside, mention may be made of two images, now damaged, of Siva and Parvati and one figure of Ganesa besides certain small fragments which can be dated between the tenth and eleventh century AD.

Ravinder Kumar, under the guidance of K.K. Sinha and Birendra Pratap Singh of the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University, also carried out exploration in the district and brought to light a number of sites of archaeological interest:

Tehsil	*Village/Site*	*Nature of remains*
Amethi	Gangauli (26° 06' 45" N; 81 °47' 45" E)	Red, black-slipped and black-and-red wares, terracotta ear-stud, glass bangles and segmented bead
-do-	Garah Mafi (26° 13' 25" N; 81° 46' E)	Red, black-slipped, NBP wares, terracotta ear-stud, ball, pendant of crystal, etched shell objects and glass bangles and pieces, and iron objects
-do-	Ghaghigarh (26° 7'N; 81° 46'30" E)	Red and black-slipped wares

Tehsil	*Village/Site*	*Nature of remains*
Amethi	Ghatampur (26°13'30"N; 81° 51' E)	Red, black-slipped, NBP and black-and-red wares, terracotta pestles, ear-studs, glass bangles, beads and iron objects
-do--d	Ghazipur (26° *T* N; 81° 57 E)	Red and black-slipped wares and stone sculpture of Durga
o-	Gokula or Danwa (26° 5'15" N; 81° 56'E)	Red, black-slipped, NBP and coarse grey wares, terracotta pestles, hanging bell, broken rattle, *ghata*-shaped bead, balls, hopscotches, bangles, terracotta sealing with Brahmi letter *'nia* glass bangles, bead of crystal and fluted core of chert,
-do-	Kusi Tali (26°10'15"N;81°46'E)	jasper and iron slag Red and Muslim glazed wares, teracotta pendants and glass pieces and bangles
-do-	Kohra (26°5'15"N;81°42'15"E)	Red, black-slipped and NBP wares, terracotta animal figurine and glass bangles and beads
-do-	Naraini (26° 6'45" N; 81° 45'E)	Red, black-slipped, black-and-red, NBP and Muslim glazed wares, terracotta pestles, animal figurine, elephant tusk, two Mughal copper coins and glass bangles
-do-	Parsawan (26° 10' 15" N; 81° 49' 30" E)	Red, black-slipped, NBP and coarse grey wares, terracotta pestl &, shell bracelets and iron slag
-do-	Raipur or Devipatan (26°9'30"N;81°48'E)	Red, black-slipped, black-and-red, NBP and coarse grey wares, terracotta animal figurine, pestle, ear-stud,
-do-	Ramchandrapur (26° 6'50" N; 82° 2'E)	plumb-bob and glass Red and coarse grey wares grey Red and coarse grey wares and glass bangles
-do-	Ramgarh (26° 5' 30" N; 81° 47' E)	Red ware
-do-	Sangarampur or Kanun (26°4'30"N;81°51'E)	Red, black-and-red and coarse grey wares, terracotta pestles, dabber, bull, pendant, chert bead, soapstone miniature image of Ganesa, glass bracelets
-do-	Sarumawan (26°15'30"N; 81°53'50" E)	Red ware and circular copper coin

Tehsil	*Village/Site*	*Nature of remains*
Amethi	Tala Bhita (26° 10'15" N; 81° 44'45" E)	Red, black-and-red and black-slipped wares and broken terracotta animal figurine
-do-	Tikar Mafi (26° 7' 45" N; 81 ° 54' E)	Red, black-and-red and black-slipped wares and broken terracotta animal figurine
Gauriganj	Aidhi (26° 13' 45" N; 82° 36' 15" E)	Red and black-slipped, NBP, coarse grey and black-and-red-wares and terracotta pestles
-do-	Aphwaia (26° 17'N; 81° 42' 15" E)	Red and black-slipped wares, terracotta pestles, human and animal legs
-do-	Baraulia (26° 17' N; 81° 37' E)	Red, black-slipped and NBP wares
-do-	Bhatgawan (26° 18' 15" N; 81° 39' 5" E)	Red, black-slipped and NBP wares, terracotta pestles, glass bangles and stone sculptures of Genesh and Sarasvati
-do-	Dakhinwara (26°23'N; 81° 35' 15" E)	Red, black-slipped, black-and-red and NBP wares, terracotta pestles, circular object with cut base and punctured all over the body, stone pestle-cum-muller, crystal bead and glass bangles
-do-	Hardon (26°16'30" N; 81° 35' 45" E)	Red, black-slipped, black-and-red and coarse grey wares, terracotta pestles, wheel and toycart
-do-	Jamen (26° 22' N; 81 ° 39' 45" E)	Red, black-slipped, NBP wares, terracotta pestles and glass bangles and pieces
	Narauli (26° 15' 15" N; 81° 31' 10" E)	Red, black-slipped, and NBP and black-and-red wares, terracotta pestles, wheel and glass bangles
-do-	Rajgarh (26° 12' 50" N; 81° 42' E)	Red, black-slipped and NBP wares, terracotta pestle, ball, animal leg, glass bead and many stone sculptures lying scattered and some are under worship
-do-	Sarai Hridaya Shah (26° 14' 45" N; 81° 40' 30" E)	Red, black-slipped and NBP wares, terracotta pestles, glass bangles and beads
-do-	Umradih (26° 19' 30" N; 81°37' 30"E)	Red, and black-slipped wares, terracotta animal figurine, rectangular bead and spherical bead of basalt
Kadipur	Aldemau Noorpur (26° 9'10" N; 82° 21'E)	Red ware
-do-	Arje (26° 4' 50" N; 82° 19' 50"E)	Red, black-slipped, coarse grey and NBP wares; terracotta pestles, animal figurines and human head and stamps

Tehsil	*Village/Site*	*Nature of remains*
Kadipur	Bharkhari (26° 7' 30" N; 82° 9' E)	Red ware and terracotta toy-cart
-do-	Chanda (26° 4' N; 82° 19' E)	Red ware
-do-	Dewrah (26° 06'30" N; 82° 21'20" E)	Red ware
-do-	Dhapapa (26°10'45" N; 82° 16' 30"E)	Red, black-slipped, black-and-red NBP and Muslim glazed wares, terracotta arecanut-shaped and *ghata*-shaped beads
-do-	Garabpur (26°4'30"N;82°13'15"E)	Red ware and glass bangles
-do-	Gauhani (26° 4'45" N; 82° 8'15" E)	Red ware and pieces of black-and-red wares, terracotta pestle and glass bangles
-do-	Kuthara (26°4'45"N;82°17'E)	Red, black-slipped and coarse grey wares, stamped pottery, terracotta animal legs and glass bangles
-do-	Manjhoi (26°7'15"N;82°11'E)	Red, black-slipped and NBP wares, terracotta animal figurine, hopscotch, pestle and brick (44 X 23 X 7.5 cm) and glass bangles
-do-	Opadhiapur (26°8'10"N;82°ll'30"E)	Red and black-slipped wares, glass bangles and pieces and copper ring
do-	Papar Ghat (26° 10'45" N; 82° 12' 30" E)	Red, black-slipped, black-and-red and Muslim glazed wares, terracotta ball, animal figurine, hopscotch, glass bangles and micro -bead
-do-	Sheogarh (26° 6'N; 82° 8'E)	Red, black-slipped, NBP and coarse grey wares, terracotta pestle, arecanut bead, glass bangles, pieces, bracelet and slags
-do-	Surajbhanpatti (26° 10' N; 82° 3' 30" E)	Red, black-slipped and coarse grey wares, terracotta ball, pestle and glass bangles
-do-	Vikramaditya (26°9'N;82°12'E) .	Red, black-an -red, black-slipped and NBP wares, terracotta pestles, bead and stone sculpture
Musafir Khana	Bhawanipur (26° 25' 40" N; 81 ° 51' 30" E)	Red, black-slipped and coarse grey wares
-do-	Chajjapur (26° 32' 20" N; 80° 40 30" E)	Red ware and terracotta areca-nut shaped bead
-do-	Himnapur (26°23'20"N; 81°55'30" E)	Red ware, terracotta animal figurine and animal leg

Tehsil	*Village/Site*	*Nature of remains*
Musafir Khana	Isauli (26° 24' 35 "N; 8 3 30" 1' 51' E)	Red, black-slipped, NBP, coarse grey and Muslim glazed wares, terracotta pestles, torso of a man, stone pounder, cylindrical jasper bead
-do-	Khartum (26° 21'25 "N; 8 3 E)	Red and black-slipped ware and glass bangles
-do-	Kishni (26° 35' N; 81° 3 45" E)	Red, black-slipped and NBP wares, terracotta animal figurine, glass bangles, bracelets and lump, lapis lazuli bead and iron object
-do-	Kochhit (26° 28'30" N; 81° 45'30" E)	Red, black-slipped and NBP wares.terracotta horse figurine with bit, stone sculptures lying scattered and under worship
-do-	Meghmau (26°29'45"N;81° 50' 15" E)	Red ware, terracotta horse, bead, bangle and glass bangles
-do	Patela (26°27'30"N;81° 53' 30" E)	Red, black-slipped, black-and-red and Muslim glazed wares, terracotta animal figurine, pestle and iron slag
-do-	Sathin (26°31'30"N;81c '41' E)	Red and coarse grey wares, terracotta bead and glass bangles
Sultanpur	Amkol (26° 19' N; 82° 06' 30" E)	Red ware
-do-	Atran or Satanpur or Pure Bag (26°10'30"N;82° 08' E)	Red, black-and-red, black-slipped and coarse grey wares, terracotta wheel, disc, pestles and glass bangles
-do-	Belhari (26°12'10"N;82c '12' 30" E)	Red, NBP, black-slipped and coarse grey wares
-do-	Bhadaiya (26°10'30"N; 82C '10' E)	Red and black-slipped wares
-do-	Bharsari (26° 08'10" N; 82° 08' 30" E)	Red, black-and-red and black-slipped wares, terracotta animal figurine, pestles, pendant, glass bangles and lump
-do-	Chandaur (26° 25'N; 81° 59' E)	Red ware
Sultanpur	Dikhauli (26° 13'40" N; 82° 02' 30" E)	Red and black-and-red wares stone pestles, iron slag pieces
-do-	Galibsahid (26° 18'45" N; 82° 06'30" E)	Red, black-and-red, black-slipped and Muslim glazed wares, terracotta pestle, iron slag and glass pieces

Tehsil	*Village/Site*	*Nature of remains*
Sultanpur	Garah (26° 21' 15" N; 81 ° 57' 15" E)	Red, black-slipped, NBP and coarse grey wares, terracotta pestles, animal leg and female bust, copper pieces and charred tooth
-do-	Gondwa Dain (26° 19' N; 82° 03' E)	Red ware, terracotta animal leg and human hand
-do-	Jurapatti (26⁶ 04' 50" N; 82° 05' 30" E)	Red, black-slipped, NBP and Muslim glazed wares, terracotta ball, pestles.animal figurines, glass bangles and bricks
do-	Lalkapura (26° 26' N; S2° 02' E	Red ware and terracotta animal leg
do-	Lauhar or Lohramau (26° 13'N; 81° 05'30" E)	Red ware
do-	Mahmudpur (26° 21'30" N; 82° 05'E)	Red and few pieces of black-slipped wares
do-	Mayang (26° 25' 30" N; 82° 02' E)	Red ware
do-	Nakaha (26°19'N;82°03'30"E)	Red ware and terracotta animal figurine
do-	Narhi Khas (26° 16' 30" N; 81 ° 59' 30" E)	Red and Muslim glazed wares, terracotta animal leg, stone sculptures and glass bangles
-do-	Pipargaon (26° 27'N; 81° 59'E)	Red ware and terracotta pestle
-do-	Sarwan (26° 20' 10" N; 82° 05' 45" E)	Red ware, terracotta wheel, pestle, iron slag, glass bangles
-do-	Sita Kund (26°16'10"N;82°05'E)	Red ware and glass bangles
-do-	Sultanpur Old or Pancho Peeran (26° 16' 50" N; 82° 05' E)	Red, black-slipped, NBP, black-and-red and coarse grey wares, terracotta pestle, glass bangles and pieces

WEST BENGAL

88. EXCAVATION AT HATIKERA, DISTRICT BIRBHUM.—N.C. Ghosh and Arun K. Nag assisted by Kapil Muni and Chitta Saha of the Department of Ancient Indian History, Culture and Archaeology, Visva Bharati University, Shantiniketan undertook excavation at Hatikera (Lat 23° 49' 25"; Long 87° 35' 42"). The site is situated 1 km west of the present village on the right bank of the river Bakresvar. The mound measures 190 m from north to south and rises 2 to 2-50 m from the surrounding ground level. Physiographically, it is located in the overlapping zone of the lateritic upland and the alluvium zone. The main aim of the excavation was to find out whether the mesolithic culture played any role in the growth of the chalcolithic culture; to ascertain the cultural sequence of the site; and to employ multi-disciplinary approaches in excavation.

Four trenches (HTR 1, 2,3 and 4) were laid at strategic locations in the site. Excavation revealed maximum deposit of 2-40 m of habitational deposit representing the Chalcolithic (Period I), and the Ferro-chalcolithic (Period II). There is neither a hiatus nor a traditional phase intervened between the two periods.

Period I is represented by 78 cm thick deposit on average and chcracterized mainly by red, black-and-red and buff wares. It is apparent from the preliminary study that the red ware was more popular than other wares. The grey and black-slipped wares are very few in number. The shapes in red ware included vase, bowl and dish. The noteworthy shapes in black-and-red ware are vessels with an out-turned rim, straight neck and angular shoulder, deep bowl/basin, deep dish with an out-turned rim on a carinated and channel spouted bowl (?). The black ware is recognized for the first time in the chalcolithic culture of West Bengal at Hatikera. It has two fabrics and the former is closer in fabric to black-and-red ware. The ware is differentiated from black-slipped on the basis of shapes only. A few sherds of black-and-red ware bear thick lines in white pigment.

Among the other noteworthy finds mention may be made of stone mullers, pounders, bead, etc., besides terracotta bead, disc with and without perforation and ball. A terracotta black and red disc (11 -5 cm dia.), bears a five point star design on its black surface executed by short punches.

The floor-levels of rammed earth.post-holes and fragments of wattle-and-daub represent their dwellings. A fire place in one of the floor levels and threshold on the east near the entrance of a floor in another case are recorded from this level.

The earlier cultural milieu continues without any perceptible change in Period II. Only the advent of iron technology in this level was the most significant innovation. Most of the shapes in red and red wares of Period I continue in this period also.

Among minor antiquities, mention may be made of stone muller, pounder, sharpener, bead and terracotta beads, ball, fragmentary figurines, etc. Eight iron pieces and few lumps of slags have been recovered. The identifiable objects include a fragment of a sickle (?). The metallurgical analysis carried in the Alloy Steel Plant, Durgapur, conclusively proved that the sickle constitute a low carbon *hyoecutectoid* steel.

The report of the Zoological Survey of India on the identification of animal bones includes domesticated variety of humped cattle, buffaloes, pig from Period I; Nearly 60% of them belong *to Bos*

Jndicus Linnaeaus (the Zebu or domesticated humped cattle).The bones of *Bos Biubalus bubal* is Linnaeus, however, are more numerous than other species in Period II. The bones of zebu, pig and goat/ sheep are also present in the later collection.

Thirteen soil samples representing entire span of habitation at the site (HTR 4), were analyzed by Indo-British Fertilizer Project, Durgapur for finding out % of phosphate, calcium carbonate, organic carbon, nitrogen, etc., content in the soil. Soil samples have been taken at 20 cms interval from entire habitational deposit of HTR-4. The analysis of the soils indicates that the maximum rise in the population had taken place in the mid level of Period II. The higher content of some of them suggest increase in human activity and presence of a later domesticated animal in the habitational area.

Six of the seven radiocarbon dates received from PRL are erratic. The only acceptable date PRL-1191; 2870±120 from HTR 4, Tr. Al, Layer (6), 1-92 below surface indicate the date of the beginning of Period II.

89. EXCAVATION AT KOTASUR, DISTRICT BIRBHUM.—The Department of Ancient Indian History, Culture and Archaeology, Visva Bharati University, Shantiniketan under N.C. Ghosh and Arun K. Nag assisted by Kapil Muni conducted a small scale excavation at Kotasur (Long 87° 46'; Lat 23° 58')- The main objectives of this season's work, apart from imparting field training to the students, was to ascertain the cultural sequence of the site and to reveal the nature of the structures. Two trenches KTS-I (10 X 10) and KTS-II (5 X 5m) were laid on the east and south-east of the Siva temple respectively. Cuttings in both the trenches were restricted in limited areas, therefore natural soil could not be reached. In view of the inconclusive nature Of the excavation the occupational deposit of 3-60 m exhumed so far was treated broadly in three levels i.e. upper, middle and lower. One and a half metre thick upper deposit bear signs of intense occupation but unauthorised diggings have disturbed the stratigraphy of this level. In KTS-I two phases of baked brick (40 x 20 x 8 cm) structure in badly robbed condition were exposed. The wall (Phase-II), was part of a room with baked paved flooring of one course. Several tiles with double perforations and shallow finger-pressed channels on the upper surface were found along with a number of iron nails from the same level. The major bulk of the pottery from this level is represented by dull red ware bowl, basin, vases, carinated *handi* often with soot marks, *kadhai* with luted handles and incense-burner. Minor antiquities from this level include a seal and sealing bearing leaf motif .animal figurines, bead and ball, all in terracotta, and iron objects.

The mid-level, nearly one metre in thickness, is marked by silt sand-streaks and eroded surface. The evidence of flooding and waterlogging is found in both the trenches. Three hearths (I, II and III) partly below surface (dia. (I) -1-65; (II) - 20-54; (III) - 30-96) were recorded from this level. Hearth II and III were brick-lined and number of iron slags were found around them.

Ceramics from the mid-level include bowls, basins, vases in red ware of medium fabric, a few thick sturdy red ware sherds of red slipped with smooth texture having moulded motifs and a few examples of incised and impressed designs. Among the minor antiquities fragments of terracotta animal figurines and stone beads were noteworthy finds.

Nearly 1.20 m thick lower deposit was comparatively free from water action than the preceding level. Three successive floors in the lower level were noticed in KTS-I. Ceramics from the level is

distinguished by sherds of NBP ware. Grey were bowl and dish and black ware generally found in association with the NBP, were also recovered.

90. EXCAVATION AT MANGALKOT, DISTRICT BARDHAMAN.—The Department of Archaeology, Calcutta University, under the direction of Amita Ray, assisted by S. C. Ray, A. C. Pal, S.K. Mukherjee, A.K. Datta.B. Chatterjeee, P. Ghosh, N.C. Das and D.K. Chakraborty, resumed excavation of the Vikaramadityer Dhibi at Mangalkot with a view to ascertaining the cultural sequence of the site and to determine the pattern of habitation in successive periods.

The excavation indicated the earliest settlement to be chalcolithic in nature. It is divisible into two phases: Period I and Period II, ranging in depth from 1 .42 m to 2 m. Period I yielded typical chalcolithic cultural assemblages consisting of ill-fired coarse handmade red ware with husk impressions, plain variety of black-and-red ware, a pale red ware decorated with hatched design, and a kind of brown ware. The shapes were mostly *handis,* bowl's and vases. The evidence of the bones of bovine animals, deer, tortoise, bird and fish indicate that these we're consumed in large quantities. The husk impression in the pottery suggested cultivation of rice. The tool kits mostly consisted of bone, but limited to points, shafts, knives and arrowheads. Microliths are represented by only a core showing definite flake marks. Evidence of copper was found in limited quantity. Two floors, made of rammed *kankar* and plastered with earth and cowdung and one hearth with some amount of charcoal, varieties of terracotta objects, such as wheel, net-sinkers, bangles, beads and a generalized form of a female were found.

Period II was represented by ceramic assemblages of atleast eight types: black-and-red, both plain and painted, bright red ware, lustrous red ware, painted in black, chocolate ware, burnished black ware, grey ware, polished black ware and mat red ware. The brown types seem to be the usual domestic ware continuing till the transitional phase. In addition to the paintings, which consisted of triangles, diagonal lines, ladder, wavy, sigma, loop, dots either in black or in white, post-firing incised marks and groovings were also found on the exterior. The other components were variety of bone tools, comprising of knife, blades, points and arrowheads made of splintered bones. The period has revealed profusion of antlers' horns and tortoise shells; some show chisel-mark giving an impression that some sharp tools made of metal were used for cutting them. Iron was also noticed for the first time. The existence of profuse quantity of iron slag including some tools like dagger and sickle indicate the knowledge of iron metallurgy. Copper was found in appreciable quantity, but here too this comprises mainly bangles open at ends, rings and fish hooks. Important antiquities include a dog in terracotta and beads of agate, chalcedony and terracotta.

The floor levels were found being superimposed one above the other. These consist of a thin layer of rammed hard brownish earth plastered with cowdung and *kankar,* occasionally treated with pottery nodules and lime. Reed-matting, plastered with mud, was picked up near the floor. Five ovens were also traced in three successive levels, arranged side-by-side on one common platform. Apart from charcoal, some charred bones were also recovered from the ovens. On one of the platforms a few large sized pots in black-and-red ware were encountered. The pottery recovered *in situ* includes *handi,* spouted and carinated vase, helmet-shaped bowl and a bowl with flaring rim. On archaeological grounds, the chalcolithic phase of Mangalkot may be dated from 1500 BC to 700 BC.

Period III (about 0.35 m in thickness) which immediately followed the previous one without any stratigraphical break, witnessed traits of transitional phase. The ceramic assemblage includes plain grey, black polished and pale red wares with a sprinkling of chalcolithic black-and-red ware. A miniature bowl in mat red of thin fabric seems to be a distinctive ceramic of this period. The period showed some coarse *handis* of mat red colour in the shapes of black-and-red ware types. This phase, on the basis of the ceramic evidence can be dated between 700 BC and 400 BC.

Period IV (about 0.35 m in thickness) followed Period III without any break. The pottery of this period is represented by black polished, pale red and grey wares, of which a few pieces were highly polished. The terminal limit of this period can be ascertained easily by the occurrence of a few pieces of fine polished NBP Ware along with a terracotta bull of black colour with punch design and a circular punch-marked coin. The period on the upper level revealed a few pieces of coarse variety of NBP Ware, and a number of typical female figurines with elaborate coiffure and draperies of the Sunga period. One piece *of yakshini* having *pancha chuda* was picked up from this level. A few pieces of cast coins with usual devices and a large number of copper pieces including a big portion of a copper bowl was found from this level. The period on the basis of available ceramic evidence and antiquities may be dated from the fourth century BC to the first century BC.

Period V, represented by 1 m thick occupational deposit, was distinguished by Sunga-Kushana pottery of the typical grey ware and red ware mostly with wash and occasionally with slip. A few of these were decorated with incised and stamped patterns. The types included vase, jar, *handi,* bowls with incurved rims, button-knobbed lids and lids like inkpots, lugged handle with punch design. Sprinklers in red ware and a few sherds of micaceous red ware were noteworthy. The occurrence of sherds of the rouletted ware signifies Mangalkot's connection with Indo-Roman trade. The other antiquities include a few significant terracotta figurines both moulded and modelled types among which may be mentioned the head of a female typical of the Sunga period, torso of a female figurine, mother and child and an image of Naigamesa. Other noteworthy finds recovered from the excavation were cast copper coins, beads of semi-precious stones, pieces of copper bangle, a number of copper pieces, ring and iron nails. The period also revealed structural complex in brick probably used for dwelling purpose. The complex showed large-scale brick activity scattered all over the mound during this phase. In one trench, a brick wall having ten courses of bricks (size 24 X 12 X 6 cm) was found running in east-west direction with a corner proceeding to the northern side of the wall. This residential complex showed a floor made of rammed mud mixed with nodules and then plastered with lime. On the centre of this floor was found embedded a huge storage jar. To the east of this, a ring well (dia. 70 cm) with fourteen segments of terracotta rings were encountered. The cavity between the side of the pit could be traced filled with silt in the section facing east. The noteworthy feature of the ring well was the circular platform around the well, providing the evidence of the working level. Another ring well with six courses of rings (not fully exposed) was also encountered. An oven showing huge accumulation of ash was also traced. The period may be ascribable to the Kushana period.

Period VI was represented by a thick deposit, yielding red polished pottery in thin fabric. A few pieces show floral designs. A brick wall of ten courses was found. On the basis of inscribed seals,

terracotta pieces of the diagnostic types, the period may be dated between the third century and fifth century AD.

The deposits of Period VII were found to have been badly disturbed during the medieval period due to extensive brick robbing. The debris thus formed have revealed various types of objects which include a flesh-rubber of the Sunga-Kushana period, Sultanate coin and two East Indian Company coins.

91. EXPLORATION IN DISTRICT MIDNAPUR.—The Directorate of Archaeology, Government of West Bengal, carried out archaeological exploration of the prehistoric sites located at Dhulaipur, Kankrajhor and Bhojanpur.

The site of Dhuliapur, about seven kilometres to the north-east of Belpahari, P.S. Binpur and is situated on the right bank of the Tarapheni, a tributary of Kansavati. The region comprising the high cliff of a stream *(nullah)* of the Tarapheni is close to the village of Belpahari. Most of the surface of the adjoining area is undulating, and thus gives an impression of alternate ridges and depression. The Archaean rock in the form of schist is exposed here and there. Stone tools appertaining to the Lower, Middle and Upper Palaeolithic times, as also microliths of the Late Stone Age and celts and adzes of the New Stone Age were found *in situ* from high cliff around. The Lower Palaeolithic tools comprise handaxes, choppers, cleavers and scrapers. The Middle Palaeolithic tools like smaller scrapers and handaxes were recovered from the junction of the upper loose gravel and upper silt. Most of Lower, Middle and Upper Palaeolithic tools have been made from quartz and quartzite.

The geo-startigraphic columns as exposed at the aforesaid *nullah* indicate that there were two gravels and two silt deposits above the bedrock and the deposits are alternate in nature indicating a diverse climatic condition.

From a study of the deposits near the *nullah* it is apparent that the river has shifted its channel and has deposited the alluvial material here, which is fan-shaped. A fossiliferrous bed was noticed in the alluvium and fossilized animal bones and stone tools were found embedded in the deposit (composed of cemented gravel overlying the basal rock). Mention may be made of femur bone of an elephant and a mandible jaw of a bovid collected from the deposit in a complete state of fossilization.

This year also, Lower Palaeolithic implements like handaxes, digging tools and bolas have been collected from the gravel bed lying at a height of 5.10 m from present water level.

The Upper Palaeolithic tools are repesented by gravers, points, blunt-headed arrows with a tang, scrapers, bone scrapers with a tang, round scrapers, hollow scrapers, knives, big size crescents and backed or humped blades.The hominids living here under the changed climatic conditions could not naturally depend upon hunting alone and they had to resort to food-gathering as well. The Late Stone Age tools consist of parallel-sided blades, backed blades, lunates, round scrapers, denticulated or saw-like blades, arrowhead, etc., made of chert, quartz, etc. The neolithic people occupied this region long after the disappearance of the microlithic-using people. A good number of neolithic tools like celts, one broken adze (made of dolerite) and few broken pieces of ringstones have been recovered from the eroded surface in its neighbourhood.

A somewhat different picture has been visualized on the southern bank of the aforesaid

meandering river, where the vestiges of the iron-using people predominate. Iron slag has been found strewn over the surface in profuse quantity.

The site Kankrajhor, lying on the western bank of the Kharasoti, a tributary of the Suvarnarekha is not faraway from the site of Dhuliapur. For understanding the geostratigraphy of the site, few cuttings were made near the slope of a denuded mound and the cliff section of the stream. The following sequences were observed:

Layer (1) recent;

Layer (2) semi-compact brown earth-iron slags, iron pins (probably collyrium sticks or styluses) and potsherds of dull red and black ware;

Layer (3) fine grey to yellow earth, sterile;

Layer (4) semi-compact yellowish sandy earth neolithic ground celts associated with fragments of a handmade bowl in pale black ware and other vessels of pale red ware and grey ware, thcikness-0.30m.

Layer (5) compact yellowish grey earth, sterile ;

Layer (6) coarse ground sandy earth with nodules yielded mesolithic implements like arrow points and blades and flakes;

Layer (7) sterile ; and

Layer (8) basal rock overlain by a pebble deposit; from this layer, one Middle Palaeolithic handaxe of quartz and one Upper Palaeolithic long blade (slightly curved) were recovered.

The two sites taken together go to show that the region was one of the nucleus zones of culture right from the Middle Palaeolithic times to the Iron Age which had enough potentiality in their respective ecological set-up.

92. EXPLORATION AT SAHARI, DISTRICT MIDNAPUR.— Atul Chandra Bhowmick of the Department of Museology, Calcutta University, in course of exploration discovered two cordiform handaxes, five lanceolate handaxes with broad and thick butt-ends, two scrapers, one cleaver, five bolas together with one point and some flake tools from surface.

93. EXCAVATION AT BALLALDHIPI, DISTRICT NADIA.—In continuation of the previous year's *(1985-86,* pp. 88-90) work the Calcutta Circle of the Survey resumed excavation at Ballaldhipi, under the direction of S.S. Biswas assisted by J. Das, T.J. Chakraborty, S.K. Ghosh, S.K. Kundu, A.B. Sen and C. Khamaru, with objectives to know the total area of the complex, the gateway of the main shrine and to know the working level of the sanctum of the temple. The exposed eastern wall in north-south orientation though badly damaged due to several brick robbings and other natural phenomena have been traced successfully. Though the exposed wall here followed a more or less uniform line, the width varied in each trench from 4-00 m to 2-39 m but the southern wall (running in east-west direction) was uniformly 3-70 m in width.

The bricks used in the inner enclosing wall were of different sizes, the measurement ranging from 22 cm x 8 cm to 14 cm x 18 cm and the thickness from 4 cm to 3 cm. Such slight deviation from the bricks exposed earlier suggest different phases of the wall.

The foundation of the wall at the depth of 2-50 m has been noticed as being strengthened by another cross wall. The utility and purpose of such an architectural plan is yet to be ascertained. Though the sanctum in the main structure was detected, the entrance in the wall leading to the main sanctum could not be ascertained.

Another miniature shrine *pancharatha* in plan, was exposed on the eastern side. In plan and other details, the shrine followed the earlier style. The potsherds recovered were coarse dull red, black and pale grey in colour.

The structure exposed earlier as well as in this season were also conserved.

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. PALM-LEAF MANUSCRIPTS, VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.— Seven palm- leaf manuscripts, belonging to sixteenth-seventeenth century, were found in between the shaft and capital of one of the pillars of the *Panchanga-mandapa.* The manuscripts are in Kannada-Telugu characters and donatory in nature.

2. INSCRIPTION, RACHANANAPALLE, DISTRICT ANANTAPUR.—This inscription belonging to Telugu-Choda family of seventh-eighth century, refers to a gift of cash along with a palm-grove as *vritti* to Akkasala Cholachari who was in service of the king's family by king Dalavaparasar. The gift was released from Kudiyamanta.

3. EARLY PALLAVA COPPER-PLATE CHARTER, PEDDAMUDIYAM, DISTRICT CUDDAPAH.—This charter is incomplete, only two plates being available, rest being lost. Written in Sanskrit language and Telugu-Kannada characters of the fifth-sixth century AD, it traces the genealogy of *Yuvamaharaja Kumara* Simhavarma of early Pallavas of Kanchi and mentions the names of the donees and their respective *gotras.*

4. TWO COPPER-PLATES, PEDDAMUDIYAM, DISTRICT CUDDAPAH.—Datable to sixth century AD, these copper-plates are in Telugu-Kannada characters and record—the genealogical details of the Pallava dynasty from Viravarman to his grandson *Maharaja* Sri Skandavarman. The copper-plates further record the gift of land to various Brahmins of different *gotras. Maharaja* Virasimhavarman was the donor.

5. TELUGU-CHODA INSCRIPTION, BAPATLA, DISTRICT GUNTUR.—Dated Saka 1047 and Chalukya Vikrama year 50 (AD 1125) and engraved on the south wall of *mahamandapa* of Bhavanarayanasvami temple, it is in Sanskrit and Telugu languages and in Telugu characters, and records a gift of six gandhavarana-madas for maintaining a perpetual lamp to the deity Bhavanarayanadeva by mahamandalesvara Tondayaraju, the lord of Maninagapura.

[1]Information from: 1 and 4, Hyderabad Circle of the Survey; 2,13,15-18,20,23-27, Department of Archaeology and Museums, Andhra Pradesh; 3,5-12,14,19,21-22,28-49, K.V. Ramesh assisted by Madhav N. Katti .M.D. Sampath. C.R. Srinivasan, S. Subramania Iyer, Venkatesha, N. Nanjunda Swamy, C.A.P. Sastri, D.M. Nagarau, S. Nagarjuna, S. Swaminathan and Ravishankar of the Epigraphy Branch of the Survey; and 50, Krishna Kumar, Registering Officer, Allahabad.

6. KAKATIYA INSCRIPTION, BAPATLA, DISTRICT GUNTUR.—Engraved on the south wall of the porch of the *mahamandapa* of Bhavanarayanasvami temple, and written in Telugu language and characters it belongs to the reign of Kakatiya king Rudradeva-Maharaju and seems to register some gift by Muti-nayamdu, for the merit of his parents. It also gives the eulogy of this chief. It is dated Saka 1199 (AD 1277).

7. INSCRIPTION OF KONDAPADUMATI CHEF, BAPATLA, DISTRICT GUNTUR.—This record, en graved on the wall of the *mahamandapa* of Bhavanarayanasvami temple, is written in Telugu language and characters. It is dated Saka 1151 (AD 1229) and registers a gift of 50 cows for maintaining a perpetual lamp to the deity Bhavanarayana by the nayakas of Remduru, for the merit of their chief Kondapadumati Betaraju. The gift was entrusted to two individuals (names mentioned) with the stipulation that they should supply ghee for the lamp.

8. CHALUKYA COPPER-PLATE CHARTER, HYDERABAD, DISTRICT HYDERABAD.—This charter, originally from the village Peddavoleti, District Kurnool, and now preserved in the Directorate of Archaeology and Museums, Hyderabad, is in Sanskrit language and early Telugu-Kannada characters of the seventh century AD. Dated in the eleventh year (AD 665-66) of the reign of Chalukya Vikramaditya I, it records the royal grant of the privilege called *peruncha* from fifty nivarttanas of land in the village Rachchamirri situated on the southern bank of the river Tungabhadra to Revasvamin, son of Madhavasarma of Kapisa-*gotra* .

9. COPPER-PLATE CHARTER OF REDDIS OF KONDAVIDU, HYDERABAD, DISTRICT HYDERABAD.—This charter is written in Sanskrit and Telugu languages and Telugu characters. Dated Saka 1345 (in chronogram *sar-abdhi*-visva = AD 1422), it belongs to the reign of Vema, son of Allada, and registers the grant of the village Kadaparru, situated on the bank of the river Tulyabhagika, to the *guru* Visvesvara-Malnadharyalinganaradhya by the king, at the time of his" mother Vemambika's initiation *(diksha)* into *Saiva-vratachara.*

10. MODERN IRON-PLATE COPY OF VAKATAK A CHARTER, HYDERABAD, DISTRICT HYDERABAD. ___ This is stated to be a modern iron plate copy of a genuine Vakataka charter of king Devasena. The original set of copper-plates was brought from somewhere in District Bidar, Karnataka. The language is a mixture of Sanskrit and Prakrit. The script employed for writing the text is an imitation of fifth century box-headed characters. The charter was issued in the fifth regnal year of the above king, whose genealogy is given in the beginning. It also registers the tax-free grant of the village Velpakonda to a certain Reddochcha chatuve (jja) for the purpose of sacrificial offering *(charuka)* by Samilladeva. The copy is said to have been prepared because of the unwillingness of the owner to spare the original.

j 1. PILLAR INSCRIPTIONS, CHIKKAVARAM, DISTRICT KRISHNA.—Of the six inscriptions engraved in Sanskrit language and Telugu characters on the four faces of a pillar in a Siva temple, the first record is dated Saka 1137 (AD 1215) and mentions king Narayana, the brother of Naga-Mahipala belonging

to Bharadvaja-*gotra* and having the insignia of the bull *vrisha-lamchchana).* It seems to record some gift made to the god Brahmesvara.

The second record is dated Saka 1157 (in chronogram *saila-bana-kshiti-sasi*= AD 1235) and registers a gift for a lamp to God Brahmesvara. It also mentions a chief, Nagadeva.

The third record is dated Saka 1179 (in Chronogram *brahma-saila-kshiti-sasi* = AD 1257) and registers the gift of 25 cows and 20 *mattar* of land for food-offerings to the deity Brahmesvara by a chief named Manma.

The fourth record is dated Saka 1180 (in chronogram *gagan-ebha-rudra* = AD 1225) and mentions a certain Komi-setti while the details of the fifth record are worn out and illegible. The sixth record is dated Saka 1183 (and in chronogram *pur-ashtadasa-sasi* = AD 1261) and registers a gift made for a perpetual lamp to the deity Brahmesvara by the Gomka chief Viranarayanachoda-Baddigadevaraju on the occasion of *samkranti* in the month Karkataka.

12. TELUGU INSCRIPTION, CHIKKAVARAM, DISTRICT KRISHNA.—This inscription, in Telugu language and characters, is engraved oh a ceiling slab of the *mukhamandapa* of the Siva temple. Dated Saka 1167 (AD 1245) it records the gift of 25 cows by Paruva Annisetti, son of Muddisetti and .Bumamba, to the south-facing god Prasannavallabha-Kesavadeva installed to the north of Nakaresvara, for maintaining a perpetual lamp, for his own merit. The gift was entrusted to one Yerra-boya for the supply of one *mana* of ghee daily for the lamp.

13. INSCRIPTIONS, ELMEL, DISTRICT MEDAK.—Dated Chalukya-Vikrama year 44 (AD 1121) and belonging to the time of Vikramaditya VI, the inscription describes the exploits of General Gandadandadhisvara ruling from Lattada-sthana, i. e. Lattalur-pura, once the capital of the Rashtrakutas. The inscription further refers the gift (details lost) to the god Tribhuvanamalla Gundesvara towards daily rites and it was placed in the custody of Jnanesvara Pandita. Another record belonging to the Kakatiya king Pratapa Rudra refers to construction of wells in the village by Gangisetti. It is dated Saka 1241 and Kaliyugabda 4420 (corresponding to 28th Nov., AD 1319).

14. KALYANA CHALUKYA INSCRIPTION, KODURU, DISTRICT MEDAK.—Engraved on a slab lying on the bund of the village tank and written in Kannada language and characters, the record is dated Saka 931 (AD 1009) and states that when the Chalukya king Irivabedemgadeva was staying in his transit camp Ravulakonde, *mahasamanta* Gangayyarasa made the grant of the village Kolur to the deity Ramesvara of Chelvarala-r/rr/za on the day of Tula-samkranti. The gift is stated to have been entrusted to Gangesvarada-Brahmalimgibhatarar of Pottalakere, after laving his feet.

15. INSCRIPTION, KOLKURU, DISTRICT MEDAK.—Dated Saka 972 (AD 1050) the inscription registers some gift (details lost) by Pampa Pennmanadi on the occasion *of Pattoddhati of the Yuvaraja* Bijjarasa while Trailokyamalladevarasa was ruling the kingdom.

16. INSCRIPTION, MALAPAHAD, DISTRICT MEDAK.—Belonging to the time of Tribhuvanamalladeva Vikramaditya VI, the inscription records the gift of land to god Somesvara of Sirigoppa towards the daily rites and the gift was placed in the custody of Pabbesvara Pandita after washing his feet at the confluence of the river Kudalasangama. It is dated Chalukya-Vikrama year 26 corresponding to Saka 1023 (30th April, AD 1101).

17. INSCRIPTION, MITTAPALLI, DISTRICT MEDAK.—Belonging to the time of Tribhuvanamalla Vikramaditya and dated Chalukya-Vikrama year 22 (corresponding to 24th March, 1098), the inscription records the gift of lands towards the daily rites of the God Somesvara of Mittapalli-*agrahara.*

18. INSCRIPTION, PULLURU, DISTRICT MEDAK.—Belonging to Ganapatideva of the Kakatiya dynasty, the inscription registers the institution of *vritti* to some person (name lost) in the service of the god Prasanna Kesava.

19. Two KALYANA CHALUKYA INSCRIPTIONS, SINGUR, DISTRICT MEDAK.—Engraved on two different slabs and found lying near the guest house at the Singur Project area, Singur, the inscriptions are in Kannada language and characters (pl. XXXVII). The first one is dated Saka 995 (AD 1074) and belongs to the reign of Chalukya Bhuvanaikamalla. It states that while the king was camping at Vankapura, *mahasamanta* Aggalarasa made grant of lands on Sunday, on the occasion of lunar eclipse, for the feeding of the ascetics in the *dana-sala,* to Dharmasagara-Siddhantadeva of Yapaniya-*samgha* and Maduva-gana. It refers to a *vaidyasikhamani, Jagadekavaidya* Agga(na)ryya to whom the gift was entrusted, after laving the feet of Jina.

The second inscription, dated in the Chalukya Vikrama year 47 (AD 1122), belongs to the reign of Chalukya Tribhuvanamalla (Vikramaditya VI), who is stated to be ruling from the capital city of Jayantipura (modern Banavasi). It records the grant of lands at Chevutakuru, on the occasion of lunar-eclipse, by *dandanayaka* Tejiranayyagalu, the brother-in-law *(mayduna)* of Mallarasa, *mahasamanta* of *Permmadi Kumara* Somesvaradeva, who was a *Mahamandalesvara* under the ruling king.

20. INSCRIPTION, TELLAPUR, DISTRICT MEDAK.—Dated Saka 1340 (AD 1418), the inscription refers to the construction of wells in the village Telumganapura by persons belonging to the Visvakarma community.

21. KAKATIYA INSCRIPTION, MATURU, DISTRICT NALGONDA.^-This inscription, in Telugu language and characters, is engraved on a pillar found in a field locally called Anjaneya-polamu. Dated Saka 1119 (AD 1197), it belongs to the reign of the Kakatiya king Mahadeva and registers the royal grant of the village Lemkala-Maraturu to the deity Mahesvaradeva, installed at the northern entrance of Sriparvata.

22. STONE INSCRIPTION OF REDDYS OF KONDAVIDU, WADAPALLI, DISTRICT NALGONDA.—This inscription, in Sanskrit language and Telugu characters of about the fourteenth century AD, describes the fort of [O]dapalli, surrounded by the rivers Vyali and Krishna, built by king Annavema.

23. INSCRIPTION, ANANTARAM, DISTRICT RANGA REDDY.—The inscription records the details of a *makhta* (rent) deed for the Fasli 1151 executed by the Deshmukha of Yedalabadu of the Haveli of Hyderabad to Shivaji Anantapantulu. It is datable to eighteenth century AD.

24. BRAHMI INSCRIPTION, CHAITANYAPURI, DISTRICT RANGA REDDY.—Engraved on a boulder near Narasimha temple and datable to fifth century AD, this two and half lines Brahmi inscription mentions *Govindavihara.*

25. KAKATIYA INSCRIPTION, KUMMARAKUNTLA, DISTRICT WARANGAL.—Belonging to the reign of the Kakatiya king Mahadeva, brother of king Rudra, the inscription is dated Saka 1119 (correspond ing to Thursday, 29th May, AD 1197) and records the construction of temples of Mahadeva, Vasudeva and Surya along with tanks, endowment of land for the daily rites of the gods as well as *Vritti* to Brahmanas by Malli Reddy of the fourth caste, a native of Repudi, the chief of *mahasamanta* Kusumenayaka.

26. KAKATIYA INSCRIPTION, TOGARRAYI, DISTRICT WARANGAL.—The inscription mentions the king Mahadeva having the titles *Sri Praudha Pratapa chakravarti, Rayanarayana and Rayabhuja-balabhima.* The inscription further records a gift of land made to the god Somanathadeva by Virayareddi within the territory of Mahadevarajya.

27. INSCRIPTIONS, MALLEPUDI, DISTRICT WEST GODAVARI.— Of the two inscriptions, first is dated Saka 1218 (AD 1296) and records the gift of cows and land for the maintenance of the daily rites to the god Agastisvara by Prithivivallabhadeva Kumara of the Later Chalukya dynasty. The second inscription is dated Saka 1202 (=AD 1280) and records the gift of cash to the god Agastisvara of Pattisa towards the expenses of a half lamp service by Annaperaka who is said to be the *devara santatula kuturu.*

28. FRAGMENTARY INSCRIPTION, PEDDAVEGI, DISTRICT WEST GODAVARI.—This fragmentary inscription, in Telugu language and characters, of about the thirteenth century AD, lying in the compound of the Paramesvara temple refers to an individual named Prolama. Further, it mentions the eighteen thousand *mahajanas* as witnesses to a gift, details of which are lost.

ASSAM

29. SANSKRIT INSCRIPTION, SILCHAR, DISTRICT CACHAR—This inscription in Sanskrit language and Assamese characters is engraved on a stone-slab, now preserved in the house of Shri Ballabh Burman. Dated Saka 1720 (in numerals and in chronogram = AD 1798), it records the completion of (the construction of) the *prasada* of Santadeva in the middle of a lake on full-moon day in Jyeshtha, by the lay-disciple Lakshmidevi, the queen of Harichandranarayana, who belonged to the lineage of Hedambachandra. The record also refers to Lakshmidevi as *rajamata* and as a powerful lady.

GOA

30. KELADI COPPER-PLATE CHARTER, PARTGAL, GOA.—This charter, in Kannada language and characters, is dated Saka 1596 (AD 1675). It was issued by queen Chemnammaji, wife of Somasekhara-nayaka. It registers several gifts by her to the temple of Venkatesvara constructed by Narayana Malle of Gamguvali in Mugunina-sime. It further registers the royal grant of the village Dharanabele along with its income to the same deity. The charter describes the donee's husband as the son of Sivappa-nayaka, the grandson of Sidapa-nayaka and the great-grandson of Samkana-nayaka belonging to the family of Keladi chief Sadasivaraya-nayaka.

KARNATAKA

31. KALYANA CHALUKYA INSCRIPTIONS, AURADI, DISTRICT BELGAUM.—These two inscriptions are engraved on a slab originally found in this village and now preserved in the Archaeological Museum, Kittur. They are written in Kannada language and characters of the twelfth century AD. The first record states that the king's subordinate *mahamandalesvara* Jayakesidevarasa of the Kadamba family was ruling over his kingdom along with his crowned queen Mailala-mahadevi. It records a number of gifts made to god Chattesvara by Chikka-gavunda and his brother Kanna-gavunda, by the crowned queen's subordinate *dandanayaka* Singarasa and by the *tontigas, gatrigas,* etc. This portion of the record ends with the statement that the above grants had ceased to be operative.

The second record, written in continuation of the first, begins with the statement that Jagadekamalla's crowned queen Machaladevi was governing Avaravadi. It is dated in Jagadekamalla's 12th regnal year (AD 1149) and records that, in order to ensure continuity, the earlier grants were reconfirmed by *perggade* Devappayya-nayaka and *mahaprabbu* Devanayya-dandanayaka on the orders of the *mahadandanayaka* Surigeya Kavanayya and entrusted to Gangarasi-pandita.

32. KALYANA CHALUKYA INSCRIPTIONS, BELAVADI, DISTRICT BELGAUM.—Of the two Kannada inscriptions belonging to the reign of the Chalukya king Bhuvanaikamalla, the first one is engraved on a stone lying in the V.R.M.S. Junior college. It is dated Saka 991 (AD 1070) and records a gift made by Narasimha-setti, Pittikabbe and Devanna-Chavundamayya for the fame of Gunakirtti-munimdra and for the feeding of the ascetics. The second one, engraved on a stone kept in front of the Durudundesvara temple, is dated Saka 992 (in chronogram *yami-namd-amka,* mistake for 997 = AD 1075) and refers to the administration of *mahasamanta* Gamdhamarasa over the Polalgumda-30 division. It registers the gift of fifty *dinaras* to the Sahasrakuta Jaina temple at Belvadi and for the feeding of the Jaina ascetics by Dayima-setti.

33. KALYANA CHALUKYA INSCRIPTION, HUNASIKATTI, DISTRICT BELGAUM.—This inscription, in Kannada language and characters of the twelfth century, is engraved on a stone originally from this village and now preserved in the Archaeological Museum, Kittur. Dated in the fifth year of the reign

of the Chalukya king Bhulokamalla, it records the grant of wet lands for various services and worship to the deity Parsvanathadeva in Manikyadeva-basadi by *mahamandalesvara* Marasimgadevarasa.

34. KALYANA CHALUKYA INSCRIPTION, TURAMARI, DISTRICT BELGAUM.—This Kannada in scription, engraved on a slab buried by the side of the Basavesvara temple, belongs to the reign of the Chalukya king Trailokyamalla Ahavamalla. Dated Saka 973 (AD 1051), it refers to the administration of a Ganga chief Kemparasa over the Komdalavali-30 division and seems to record the grant of wet lands for the lake Kuppeyagere at Keregunda. It also registers the grant of nine *mattars* of wet land for its upkeep by Dayabbe of Rashtrakuta lineage.

35. KALYANA CHALUKYA INSCRIPTION, CHIMMALGI, DISTRICT BLJAPUR.—This Kannada in scription is engraved on a stone lying in a burial place in the village. It belongs to the reign of the Chalukya king Tribhuvanamalla (Vikramaditya VI) and is dated in the Chalukya Vikrama year 7 (AD 1083). It refers to *mahamandalesvara* Bhivanadeva as governing the Tarddavadi—1000 division and records the grant of twelve *mattars* of land to the deity Tumbura-Naradesvaradeva on the bank of the river Krishna at Sirimalage on the day of *Uttarayana-samkranti.*

36. KALYANA CHALUKYA INSCRIPTION, GADAG, DISTRICT DHARWAR.—This Kannada inscrip tion, engraved on the ceiling of the *pradakshina-patha* of the Trikutesvara temple, belongs to the reign of the Chalukya king Trailokyamalla (Somesvara I). Dated Saka 976 (AD 1054), it credits his son *mahamandalesvara* Bhuvanaikamalla Somesvara II with titles like *Vemgipuravaresvara, hayavatsaraja,* etc., and refers to him as the governor of the Belvola-300, Purigere-300, Kundure-500 and Palasige-12000 divisions. It registers the gift of income from taxes on gardens to the *four gavundas* of Nagavadi, on the occasion of solar eclipse, by *dandanayaka, mahasamantadhipati* Muttapayya, son of *perggade* Somanathayya.

37. VIJAYANAGARA INSCRIPTION, HIREKERUR, DISTRICT DHARWAR.—This Kannada inscription, engraved on a stone slab in the bund of a tank of the village, belongs to the reign of Sadasivaraya and is dated Saka 1472 (AD 1550). It records the remission of taxes like *siddhaya, manevana, kanike, kaddaya,* etc. on barbers *(gaddada-kalasigalu)* by *mahamandalesvara* Ramarajendra-maha-arasu in recognition of the service rendered by three barbers named Timmoja, Kondoja and Bhadroja.

38. KALYANA CHALUKYA INSCRIPTION, DEGALMADI, DISTRICT GULBARGA.—This Kannada inscription is engraved on a pillar in front of the Sangamesvara temple and belongs to the reign of Chalukya Trailokyamalladeva (Somesvara I). Dated Saka 988 (AD 1067), it registers a gift as *sarvamanya* to Vidyadhipati-pandita, the *sthanapati* of the temple of Kalidevesvara the image of which was installed by *mahamandalesvara* Lakshmikanta.

39. VIJAYANAGARA INSCRIPTION, BAVIKERE, DISTRICT NORTH KANARA.—This Kannada inscri-ption engraved on a stone set up in a field belonging to one K.K. Nayak, refers itself to the reign of

Vira-Bukkaraya. Dated Saka 1284 (AD 1361), it registers the gift of the village Bavayakere to the preceptor Kriyasaktisvara by *mahapradhana* Basaveya-damnayaka. It further seems to record the assignment of income from the village for the worship of the deity Mahabaladeva and for the feeding of the *brahmanas* in the choultry at Gokarna-kshetra, with the consent of the chief and his *guru.* The donor is stated to have obtained the gift-village included in Amkoleyanadu as *rahultana* from the king.

MAHARASHTRA

40. RASHTRAKUTA INSCRIPTION, MEHUN, DISTRICT JALGAON.—This Sanskrit inscription in early Nagari characters is engraved on a slab in the temple of Mukta Bai on the bank of the river Tapti. It belongs to the reign of the Rashtrakuta emperor Govinda III, who was also known as Jagattunga and Srivallabha and is dated Saka 728 (AD 806). This important inscription refers in the introductory portion of the text to the construction of a temple for the Sun-god named herein Mugdhaditya by Subhakanta, a Haihaya chieftain, who had obtained the lordship of Sompili-nagara by the grace of Vikramaditya, obviously one of the two rulers of that name, belonging to the Chalukya dynasty of Vatapi. The inscription further states that the temple had fallen into disrepair in course of time and that it was reconstructed by the Rashtrakuta emperor, the work of reconstruction having started in the Saka year 728. The reconstruction was executed by the architect *(sthapati)* Naruka Upadhyaya. After referring to an earlier grant of land made by king Satyasraya, obviously one of the Vatapi Chalukya rulers, the inscription refers to the grants made in the Saka year 747 (AD 825) during the reign of Srivallabha Amoghavarsha of the Rashtrakuta family to the same god herein called Ugraditya-bhattaraka. The inscription was engraved by Naviyappa, son of Sankaragana on the orders of the emperor.

ORISSA

41. EASTERN GANGA INSCRIPTION, PURI, DISTRICT PURL—Engraved on the right side wall of the Narasimha shrine in the Jagannatha temple, it is in Sanskrit and Telugu languages and respectively in Gaudiya and Telugu characters. Belonging to the reign of the Eastern Ganga King Chodaganga and dated Saka 1035 (AD 1113), it records various donations to God Purushottama. The donated objects include perpetual lamps *(akhanda-dipa),* oil, money, etc. The donors included officials and private individuals.

RAJASTHAN

42. PEDESTAL INSCRIPTION, JALINDRI, DISTRICT BHILWARA.—This inscription, in Sanskrit language and Nagari characters and engraved on the pedestal of an image of the goddess Chamundi, now kept in the Maruti-mandir, is dated Vikrama 1445 (AD 1388) and records probably that the image was caused to be made by a certain Deva on the above date.

TAMIL NADU

43. CHOLA INSCRIPTION, VAYALUR, DISTRICT CHINGLEPUT.—This inscription, in Tamil lan guage and characters, is engraved on a stone in front of the Vyaghrapurisvara temple and it is dated in the eleventh year (AD 995-96) of the reign of the Chola king Rajaraja I and records the gift of 90 sheep for maintaining a perpetual lamp to the deity Mahadeva of Enramur in Mondur-[na*]du in [A*]murk-kottam by Karaiyudaiyan Attiyuradiyal senda[ma*]raikkannan.

44. THREE KONGU CHOLA INSCRIPTIONS, KADATTUR, DISTRICT COIMBATORE.—Of these three Tamil inscriptions, the first is dated in the twenty-ninth year (AD 1033) of the reign of the Kongu-Chola king Vikramachola. It records the provision made for the *ardha-yama* worship of the deity Aludaiyar Tirumarududaiyar of Kadarrur by an individual named Vikramasola Tribhuvanasingadevan by way of thanks giving to the god for curing him from diabetes *(prameha)*.

The second record is dated in the twenty-first year (AD 1140) of the reign of the Kongu-Chola king Virachola and records that one tenth portion of the *Uttirapadai* (cross-beam) was caused to be consructed by Pavanan Kanmay who belonged to Chettichi community and was a resident of Kadarrur.

The third inscription is dated in the 21st + 1st year (AD 1141) of the reign of the same king and records a gift of one tenth portion of *Uttirapadai* (cross-beam)by Chetti of the Yellan-Mullagal community of Kadarrur.

45. THREE KONGU-PANDYA INSCRIPTIONS, SEVUR, DISTRICT COIMBATORE. __Of the three inscriptions engraved on the wall of the central shrine of the Perumal temple, in Tamil language and chracters, the first is dated in the twenty-fourth regnal year of Sadaiyavarman Tribhuvanachakravarti Sundara-Pandya (AD 1274-75) and states that Malaiyalar, Arivar, Kannadiyar, Telungar and Savalakkarar, belonging to the group called Adagaimanarnalil-Vidaipper of the temple, got the beam *(uttirapadai)* and the portion forengraving the inscription *(elutagam)* made in the temple of Tirumerkoyil-nayinar at Sembur *alias* Sembiyankilanadinallur in Vadaparisara-nadu.

The second inscription is dated in the twenty-fifth year (AD 1275-76) of the same king and registers the grant of forty *panam* annually for the supply of two flower garlands to the deity Eduttagai Alagiyanayinar at the northern *gopura* of Tiruvarangam (Srirangam) by the *nattavar* of Vadaparisara-nadu.

The third inscription is dated in the ninteenth regnal year of Virapandya. It refers to the consecration of the images of Manavala-alvar and his consort Nachchimar in the temple of Algapperumal *alias* Sundarapandya-Vinnagar at Sevur *alias* Sembiyankilanadinallur in Vadaparisara-nadu by the merchants of the above *nadu.*

46. COPPER-PLATE CHARTER, TIRUVADUTURAI, DISTRICT THANJAVUR.—This charter, preserved in the same *matha* and written in Tamil language and Tamil and Grantha characters, belongs to the reign of Ramanaryar Sri Rayar. Dated Saka 1663 (AD 1741), it registers the grant of wet and dry lands in Alunjiendal as *sarvamanya* by Muttu Vanangamudit-Tondaimanar to the pontiff of Tiruyaduturai for

conducting the worship called *Mahesura-pujai.* This charter was attested by Attavanaich-Chidambaranadan.

47. MARATHA COPPER-PLATE CHARTER, TIRUVADUTURAI, DISTRICT THANJAVUR.—This charter, preserved in the same *matha* and written in Tamil language and Tamil and Grantha characters, give the genealogy of the ruling king Tulasi-maharaja of the Posala family and is dated Saka 1651 and Kali 4830 (AD 1729). It records the grant of Sirupanaiyur included in the Kovilkkottai-maganam by Vijayaregunathayalar Sikishanagopalar, who had the *kani* right at Sirunellikkottai in Papparkudi-nadu in Poyyur-kurran in Rajendrachola-valanadu in Rajaraja-valanadu for the purpose of worship, food-offering and lamp to the deity Aludaiya-Paramasvami and goddess Sivayoganayagi of Taniyur-Tirupperundurai-Pavitramanikka-chaturvedimangalam, a *brahmadesam* in Naduvil-kuttam in Milalai-kuttam. It was laid down that the worship was to be conducted from the income collected, excluding the cess called *aramanaivaram* and *pirakkudivaram* levied from the lands in Sirupanaiyur.

48. PANDYA COPPER-PLATE INSCRIPTION, TIRUVADUTURAI, DISTRICT THANJAVUR.—This cop per-plate charter, preserved in the *matha* of the Gomuktisvara temple, is in Tamil language and Tamil and Grantha chraracters. Belonging to the reign of the Pandya King Maravarman Tribhuvanachakravarttigal Pandyadeva and dated in his fifth regnal year and Saka year 1325 (AD 1403), it registers the grant of lands in the villages of Pudur and Kilkkudi, made after purchase for a value of thousand two-hundred *panam* from *the mudaligal of* Vada-Vellarru-nadu by Tondaimanar, as *sarvamanya* to the deity Na[ya*]nar Aludaiya-Paramasvamigal of Taniyur-Perundurai *alias* Pavittiram [ni*]kka-chaturvedimangalam, a *brahmadeya* in Naduvir-kuru in Milalaik-kurram, to meet the expenses for conducting the ten day's festival commencing from the day of asterism Sadaiyam and ending with the day of Tiruvadirai. The donor is stated to have obtained the lands as *tirunamattu-kkani* from the king and endowed them for the merit of Arasu Suryadeva of Arantangi in Ilango-nadu in Sundarapandya-valanadu.

49. VIJAYANAGARA COPPER-PLATE INSCRIPTION, TIRUVADUTURAI, DISTRICT THANJAVUR.— This copper-plate charter preserved in the same *matha* and written in Sanskrit language and Nandinagari characters, belongs to the reign of the Vijayanagara king Venkatapatidevaraya. Dated Saka 1520 (in chronogram *dasa-netra-kalmb-endu* = AD 1598), it registers a royal grant of the village Kil-Mathura in Javvala-nadu in Vaigha-valanadu in Mathura-mandala to several *brahmanas* of different *gotras* at the request of Krishna-mahipa. It further mentions Venkatapati as the minister *(sachiva)* of the king. Kamakshi and Kamayacharya are referred to as the composer and the engraver of the charter respectively.

UTTAR PRADESH

50. BRAHMI INSCRIPTION, KAUSAMBI, DISTRICT ALLAHABAD.—The inscription is in Brahmi script and records the names of some unknown kings.

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. INSCRIPTIONS OF MINOR CHIEFS, DISTRICT KURNOOL;—A metrical epigraph from Sirvel of the time of Nawwab Rasul Khan (of Kurnool), records the construction of a mosque by Habibu' IIah in AH 1244 (AD 1828-29). It was composed by Shah Kamal. Another metrical inscription of the time of Nawwab Fateh 'Ali Khan (Nawwab of Banganapalle) found at Banganapalle, records the construction of a gateway of the palace (i.e. an Imam Bara) in AH 1291 (AD 1874-75), by Ibrahim Ali Khan. It was composed by Shahwar.

2. MISCELLANEOUS INSCRIPTIONS, DISTRICT KURNOOL.—An epitaph from Banganapalle, records the death of a lady named Khairu'n Nisa in AH 1012 (AD 1613). Another epitaph from Gondiparla, records the death of Sayyid 'Alavi', described as a pious and a learned person in AH 1288 (AD 1813). An inscription composed in Urdu also from Banganapalle, records the construction of an *'Ashur-Khana* (a building for the observation of Muharram mournings) by Fath Nasib son of 'Ali in AH 1233 (AD 1817-18); it was composed by Jauhar. Another epitaph from Tarturu records the death of Muhammad Khan of high rank in AH 1239 (AD 1823-24). Three records in three languages. Persian, Urdu and English-of identical purport from Kurnool, from a funerary record of Madame Charlotte Routier who died in AD 1824. An epitaph from Kodumuru records the construction of a mosque and a well by Shah Wahidu' Han of Qadiriyya family in AH 1264 (AD 1847-48). The record has another date AH 1268 (AD 1851-52) which is probably that of the setting up of the inscriptional slab. Another epigraph from Kurnool, records the construction of a mausoleum of Sayyid Ahmad Bukhari in AH 1267 (AD 1850-51). A metrical epigraph from Gargeyapuram, states that the *sara* (inn) and the reservoir were constructed on the highway in AH 1272 (AD 1855-56) by Bahadur son of Nawwab Ghulam Rasul Khan at the behest of the mother (name not given but evidently she was Rahat Afza as mentioned in the next record) of late Khan-i-A' zam (or A'zam Khan); it was composed by Shahwar. Another record from the same place, refers to the construction of a well for the sake of allah by Rahat Afza, the mother of A'zam Khan in AH 1272 (AD 1855-56).

DELHI

3.. MISCELLANEOUS INSCRIPTION, DELHI.—A damaged and fragmentary epigraph from Delhi, records the death of Khwaja Muhammad Tahir in AH 976 (AD 1568-69).

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[1] Information from N.M. Ganam, assisted by M.F. Khan, S.S. Hussain, M.I. Quddusi and C.S. Khwaja of the Epigraphy Branch of the Survey, Nagpur.

GUJARAT

4. INSCRIPTION OF MINOR CHIEF, AMOD, DISTRICT BHARUCH.—This epigraph, records the construction of a mosque by Fateh Singhjiv son of Jaswant Singh (Rana of Amod) in AH 1311 (AD 1893-94).

5. INSCRIPTION FROM CHANCHVEL, DISTRICT BHARUCH.—A damaged inscription on the sarcophagus of a grave, records the death of a person (name lost)in AH 853 (AD 1448).

HARYANA

6. MISCELLANEOUS INSCRIPTION, KARNAL, DISTRICT KARNAL.—This fragmentary record refers to the construction of a mosque in AH 1087 (AD 1676-77).

7. MUGHAL INSCRIPTION, KARNAL, DISTRICT KARNAL.—This inscription of Humayun, originally recovered from Bohri Sayda and now preserved in the office of the Registering officer (Antiquity) at Karnal, records the construction of a mosque in AH 940 (AD 1534) by Muhammad son of Darwish Muhammad of Gangoh (in Uttar Pradesh).

MAHARASHTRA

8. BAHMANI INSCRIPTION, DASHMIGAVAN, DISTRICT AHMADNAGAR.—Dated AH 906 (AD 1501), this record of Mahmud Shah Bahmani states that having got the happy news in a dream from Shaikh—Faridu'd-Din Ganj-i-Shakar, one Yusuf son of' Ali Shah Quaraishi, the armour-bearer and the native of the town of Parenda carried out the construction of the tomb of Maliku'-Masha'ikh Makhdum Shaikh Yusuf Qattal during the time of Majlis-I-Ashraf Malik Nizamu'1-Mulk, son of Nizamu'l Mulk.

9. SHAHI INSCRIPTION, DASHMIGAVAN, DISTRICT AHMADNAGAR.—Dated AH 1000 (AD 1591-92), this short bilingual record states that the (construction) work was carried out by Burhan Nizam Shah II.

10. MISCELLANEOUS INSCRIPTIONS, DISTRICT BHIR.—A short record from Georai refers to the construction of an 'Idgah by 'Abdu'n-Nabi in AH 1078 (AD 1667-68). A badly damaged epitaph recording the death of Nahar Khan in AH 1119 (AD 1707-08) was found at Ashti. According to an epitaph from Chausala, the construction of the blessed mosque was completed in AH 1272 (AD 1855-56) by Burhan Baig, the deputy, at the order of Sayyid Sharafu'd-Din 'Ali Khan, the governor *(hakim)* of the province of Beed (i.e. Bhir).

11. MUGHAL EPITAPH, ASHTI, DISTRICT BHIR.—The damaged inscription of later Mughal king Shah 'Alam I records the construction of a well by Nawwab Sangram Khan, son of Nahar Khan in AH 1119 (AD 1707-08).

12. MUGHAL INSCRIPTION, BHIR, DISTRICT BHIR.—An interesting and historical epitaph states that in his twenty-fifth regnal year, Sultan Abu'z-Zafar Muhyiu'd-Din Muhammad Aurangzeb Bahadur' Alamgir Badshah Ghazi, after the conquest of the kingdoms of Marwar and that of the Rana

(of Mewar), had encamped in the Deccan in pursuit of the rebellious (prince) Akbar. He conquered the kingdoms of Bijapur, Hyderabad and Adoni, and the forts of Raheri, Satara, Narnala, Jinji, etc. In his forty-sixth regnal year, when the fort of Khelna, one of the strongest forts of Deccan was besieged, the emperor conferred the Governorship of the province extending from Bijapur to Khujista Bunyad (i.e., Aurangabad) to Nawwab 'Umdatu'-l-Mulk Ghaziu'd-din Khan Bahadur Firuz, Jang. It was in the aforesaid regnal year corresponding to AH 1113 (AD 1701) that a lofty place of prayer (i.e, an 'Idgah on which it appears) was completed under the Superintendence of Haji Sadr Shah who as the deputy of Umdatu' 1-Mulk had been posted at Beed (i.e. Bhir) for its administration (pl. XXXVIIIA). Another badly damaged inscripton of Ahmad Shah (AD 1748-54) also records the construction of a mosque.

13. MUGHAL INSCRIPTIONS, GEORAI, DISTRICT BHIR.—This record of the time of Aurangzeb states that a fort in the town of Georai was completed during the administration of Sardar Khan Tarin, the *faujdar* of the *Paragana* of Beed (i.e. Bhir), through the efforts and under the superintendence of ' Azmat Khan Lodi (?) in the twenty-second regnal year of the king i.e. AH 1089 (AD 167-8). Another epigraph of Aurangzeb from Georai, states that the construction evidently, of a step-well (on which it appears) was completed at the instance of Miyan Achpal or Achhal (son of) Ma'mur Khan Ma'muri' Al-Husaini in AH 1105 (AD 1693-94).

14. MUGHAL INSCRIPTIONS, MANJLEGAON, DISTRICT BHIR.—Two almost identical inscriptions of the tomb of Aurangzeb records the construction of a mosque in AH 1104 (AD 1692-93) by Qadi 'Abdul'l-Qadir.

15. INSCRIPTION, PATHRUR, DISTRICT BHIR.—An epitaph of Aurangzeb states that during the time of 'Umdatu'1-Mulk Nawwab Ghaziu'd-Din (khan), Haji 'Abdul'llah Mujahid Khani constructed a mosque near the tomb of Shaikh (Khwaja Mahmud Shah Siddiqi) in the forty-seventh regnal year of the king AH 1115 (AD 1703-04).

16. MUGHAL INSCRIPTION, NAGARSUL, DISTRICT NASIK.—This inscription of king Muhammad Shah states that the gateway of the town Nagarsul, which was the *jagir* of Nawwab Sayyid Lashkar Khan Bahadur, was built anew by Muhammad Isma'il Khan during the governorship of Muhammad Murad Khan in AH 1159 (AD 1746).

17. MISCELLANEOUS INSCRIPTIONS, DISTRICT NASIK.—an epitaph from Patoda records the death of a child named Khwaja Muhammad Amin, son of Khwaja Inayat, son of Khwaja Muhammad Tabrizi, better known as Almas in AH 987 (AD 1579). He was born in AH 986 (AD 1578). A badly damaged and fragmentary inscription from the same place, records the construction of a mosque by 'Abdu'llah son of (name lost) Tazrizi in AH 1004 (AD 1603). An epitaph from Galna fort records the martyrdom in AH 1038 (AD 1628-29) of Tahir Muhammad who was poisoned by his slave-girl and struck by an arrow on the head. A bilingual epitaph from the same place, states that Lieutenant Allsop of 11th Regiment died in AH 1220 (AD 1805) at the age of sixteen years.

18. ADIL SHAHI INSCRIPTION, ARAG, DISTRICT SANGLI.—Dated AH 996 (AD 1587), this inscription furnishes an interesting information that during the reign of Ibrahim 'Adil Shah II and (in the time of) Mir Jumla Khan-i-Azam Dilawar Khan, the boundary of the village Arak has been fixed as per the order of the king. The other administrative officers mentioned in the record are: Bilal Khan, the *hawaldar,* Sayyid Mahmud, the *Na' ib-i-Ghaibat* (minster-in-absence) of the *mu'amala* (district) of Mubarakabad (i.e. Miraj) Malik Raihan, the *salahdar* (armour-bearer) of the royal court, Sharza Khan, the *Muqasadar* (i.e. fief holder) of the village Arak, Sayyid Nuru'd-din, *Mahaldar* of royal court and Mansur Khan the *Sabarati* of village Arak. It concludes with an imprecation against anyone who tries to reomove the boundary line.

19. MISCELLANEOUS EPITAPHS, DISTRICT SANGLI.—A badly damaged epitaph from Karajagi, records the martyrdom in AH 972 (AD 1565) of a saintly person whose name reads like Shaikh Mu'in (u'd-din). Another slightly damaged epitaph from Miraj, states that Khwaja Shamsu'd-Din Muhammad Shah, son of 'AH Shah Swalaki (or Solaki) obtained martyrdom in AH 978 (AD 1570) in the city of Bijapur.

20. SHAHI INSCRIPTION, SHOLAPUR, DISTRICT SHOLAPUR.—The bilingual inscription, records the construction of a mosque, a cistern and a garden of Penth 'Adilapur under the superintendence of Babaji Dabit Khan, the deputy in AH 978 (AD 1570-71) at the order of 'AH 'Adil Shah I (pl. XXXVIIIB).

21. INSCRIPTIONS, SHOLAPUR, DISTRICT SHOLAPUR.—A short inscription refers to the construc tion of a fountain in AH 1072 (AD 1662). Another epigraph from the same place, forms an epitaph of Salabat Khan, the Subedar, who died in AH 1264 (AD 1848).

22. MUGHAL INSCRIPTIONS, SHOLAPUR, DISTRICT SHOLAPUR.—This damaged record states that Mathramal son of Mulchand son of Rub (Rup) Chand, Khatri by clan, a native of the city of (name not legible) and the agent of the *zamindar* of Pathiyar (?) in the Kangra hills, had come with the victorious army of emperor 'Alamgir Ghazi (Aurangzeb). He constructed a well for obtaining divine favour on the eleventh of the month of Dhi'l-Qa'da in the year AH 1095, nineteenth Mihr of the Ilahi month corresponding to twelfth of Asoj, Sudi (Vikrama), Samvat 1741 (AD 1684, October 10). Another damaged metrical inscription of Aurangzeb, records the construction of well *(Chah-i-Shirin)* by Ya'qub Baig *Top Andas* (gunner) in AH 1092 (AD 1681) and it was composed by Zarifi.

UTTAR PRADESH

23. EPITAPH, AGRA, DISTRICT AGRA.—This epitaph in characters of the sixteenth century, points to the grave as that of Muhammad Qasim better known as Mir Qasim Hashimi Dehbidi (i.e. of Dehbid in Iran), son of Mir-i-Miran, son of Sayyid Qasim and his pedigree is further traced to the fourth Caliph AH.

24. INSCRIPTIONS OF AURANGZEB, AKBARPUR, DISTRICT BANDA.—This Inscription refers to the construction of a mosqe by Shaikh Muhammad in AH 1072 (AD 1661-62). Another inscription in Persian verse of the same king from Pailani, records the completion of a mosque by Muhammad Kazim, the governor *(Hakim)* of Pailani in AH 1190 (AD 1707).

25. EPITAPHS, BANDA, DISTRICT BANDA.—Of the three epitaphs, the first one records the death of Mardan Khan, son of Warith Khan in AH 1244 (AD 1828-29). The second epitaph records the death of Muhammad 'AH, described as *the Mufti* (the expounder of the Muhammadan Law) in AH 1247 (AD 1831). The third record refers to the construction of a mosque by Khairat 'Ali in AH 1265 (AD 1849-50).

26. MISCELLANEOUS INSCRIPTIONS, KALINJAR, DISTRICT BANDA.—This inscription states that in the time of Qasim 'Ali Khan, Mirza Baig, who earned respect and honour from the former, constructed a building (obviously the tombon which it appears) of Shaikh Bhuwa in AH 986 (AD 1580-81). Another two epitaphs from the same place record the demise of Nawwab Mir Khan and Mirza Allah Quli Baig repsectively in AH 1140 (AD 1728) and in AH 1141 (AD 1729).

27. EPITAPH, SIMAUNI, DISTRICT BANDA.—This epitaph states that Nawwab Shah Quli Sultan constructed a mosque in AH 988 (AD 1580-81).

28. EPITAPH, JALESAR, DISTRICT ETAH.—This epitaph registers the death of a lady (name not mentioned), the mother of Fateh Ali in AH 1197 (AD 1782-83).

29. MUGHAL INSCRIPTION, SARAI SHAIKH, DISTRICT MAINPURI.—This epitaph of Akbar records the construction of a mosque by Shaikh Mu'inu'd Din in AH 975 (AD 1568).

III. NUMISMATICS AND TREASURE TROVE[1]

ANDHRA PRADESH

1. GOLD COINS, GARLA MANDALAM, DISTRICT KHAMMAM.—Eighty-eight gold coins issued by the Vijayanagara rulers were acquired as treasure trove.

MAHARASHTRA

2. COPPER COINS, AURANGABAD, DISTRICT AURANGABAD.—Two medieval copper coins were collected from the western premises of Bibi-Ka-Maqbara.

3. COPPER COINS, DAULATABAD, DISTRICT AURANGABAD.—Seven copper coins belonging to medieval period were collected from the vicinity of the Daulatabad fort.

4. COINS, PAITHAN, DISTRICT AURANGABAD.—Ten lead, potin and copper coins of early historical period, thirteen copper coins of medieval period and five lead and potin coins of Satavahana period were collected from the ancient site Paithan.

RAJASTHAN

5. MISCELLANEOUS COINS, BHARATPUR, DISTRICT BHARATPUR.—The Government Museum, Bharatpur, acquired five coins, assignable to tenth century AD from Bharatpur town.

6. MISCELLANEOUS COINS, BHILWARA, DISTRICT UDAIPUR.—Twenty-three Mughal and nineteen Mewar, State coins were acquired by the Government Museum, Udaipur, from Bhilwara.

UTTAR PRADESH

7. SILVER COINS, KALWAR-KA-PURA, INAYAT, DISTRICT ALLAHABAD.—Ten silver coins of Shah Alam II found from the field and now lying in the custody of the Police Station, Utraon, were identified.

8. GOLD COINS, MAIMUDPUR BIJA, DISTRICT FARRUKHABAD.—Four gold coins of Samudragupta were noticed in the custody of Police Station, Kannauj.

9. GOLD COIN, RAIPUR BHAGROL, DISTRICT FATEHPUR.—One gold coin of Chandragupta II was noticed in the custody of Tehsildar Khaga. It bears the figure of standing king with bow and arrow on the obverse and seated Lakshmi on the reverse. The legend reads *'Chandra'* and *'Sri Vikramah'* in Brahmi characters.

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[1]Information from: 1, Department of Archaeology and Museums, Andhra Pradesh; 2-4, Aurangabad Circle of the Survey; 5-6, Department of Archaeology and Museums, Rajasthan; and 7-9, Krishna Kumar, Registering Officer, Allahabad.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. ANCIENT SITES, TEMPLES, FORTS, SCULPTURES AND INSCRIPTIONS, DISTRICT ANANTAPUR.—Discovery of number of neolithic-chalcolithic and megalithic sites, temples, forts, sculptures and inscriptions from the district was reported by the Department of Archaeology and Museums, Andhra Pradesh.

2. FORT, JAGANNATHAPURAM, DISTRICT KHAMMAM.—The Department of Archaeology and Muse ums, Andhra Pradesh, located ruined medieval fort at Jagannathapuram.

3. FORT AND SCULPTURES, KALAKURU, DISTRICT KHAMMAM.—Basement of ruined fort and two sculptures were discovered by the Department of Archaeology and Museums, Andhra Pradesh.

4. SIVA TEMPLE, PULLURU, DISTRICT KHAMMAM.—The Department of Archaeology and Museums, Andhra Pradesh, noticed a *trikuta* type temple assignable to twelfth century AD

5. MEDIEVAL STONE SCULPTURES, MADDOTIPALLI, DISTRICT KRISHNA.—One image each of Ganesa and Venugopala, was noticed by the Department of Archaeology and Museums, Andhra Pradesh.

6. TEMPLES, KULLURU, DISTRICT NELLORE.—The Department of Archaeology and Museums, Andhra Pradesh, located a temple dedicated to Siva on the north-west of the village. The temple is datable to thirteenth-fourteenth century AD. Besides, another historical temple of the Vijayanagara period was also noticed on the outskirts of the village. The temple consists of a sanctum, *mukhamandapa,* and a sub-shrine of Hanumana. The image of Vishnu is enshrined in the main sanctum.

7. TELUGU INSCRIPTIONS, GUDLURU, DISTRICT PRAKASAM.—A few inscriptions in early Telugu characters were found engraved on the walls of the Kesavasvami temple.

GUJARAT

8. MEDIEVAL SCULPTURES, TALAJA, DISTRICT BHAVNAGAR.—L.M. Wahal of the Vadodara Circle of the Survey noticed few stone sculptures. Among them the images of Indra, Parsvanatha, Chandraprabha, Neminatha and Ambika are noteworthy.

9. STONE SCULPTURES, ASODA, DISTRICT MAHESANA.—L.M. Wahal of the Vadodara Circle of the Survey discovered an image of Kubera and few other fragmentary stone sculptures.

10. MEDIEVAL SCULPTURES, PILUDRA, DISTRICT MAHESANA.—L.M. Wahal of the Vadodara Circle of the Survey noticed stone image of Chamunda, dancing Siva, Tripurantaka, *apsaras* and *dikpalas* and several architectural members.

11. MEDIEVAL SCULPTURES, DHANK, DISTRICT RAJKOT.—Few stone sculptures representing Ambika, Parsvanatha, Sambhavanatha, Mahavira and Bahubali were discovered by L.M. Wahal of the Vadodara Circle of the Survey.

JAMMU AND KASHMIR

12. CHORTENS (STUPAS) AND FORTRESS, DISTRICT LEH.—L.P. Thapliyal and A.K. Pandey of the Srinagar Circle of the Survey noticed a few dilapidated *chortens* (stupas) on the left side of Phyang-Murudok road and ruins of an old fortress, a few kilometres ahead on the barren cliff.

13. ANCIENT MONASTERY, MURUDOK, DISTRICT LEH.—L.P. Thapliyal and A.K. Pandey located an ancient monastery, dedicated to Padmasambhava. It is facing east and comprises of square chamber measuring 5-18 x 5-02 m. In the centre of the *gompa* is an altar on which are placed the images of Milarepa, Padmasambhava and other divinities. Its four walls contain murals depicting Sakyamuni Amitabha, Vajradhara, Vairochana, etc. These murals can be dated to *circa* eleventh century AD.

14. STONE SCULPTURES, NARANAG, DISTRICT SRINAGAR.—The Srinagar Circle of the Survey discovered a head of Siva and fragmentary piece having inscriptions in Sarada characters at Naranag (pl. XXXIX).

f 5. SCULPTURES AND SITE, GARHADHAMMA, DISTRICT UDHAMPUR.—S. N. Kesarwani and R.N. Kaw of the Srinagar Circle of the Survey noticed a few stone sculptures and an early medieval site.

KARNATAKA

16. MEGALITHS, INGALDHAL, DISTRICT CHITRADURGA.—The Bangalore Circle of the Survey discovered eight megalithic burials on the southern slope of the hill locally called Belligudda of which one was exposed. It has an oblong pit (1.5 m deep) cut into hard *kankary* soil. The usual burial appendage includes iron implements such as hilted dagger, knife, tongs and nails.

MADHYA PRADESH

17. TEMPLES AND SCULPTURES, BHAIUSDEHI, DISTRICT BETUL.—A good number of sculptures and temples were discovered by the Department of Archaeology and Museums, Madhya Pradesh.

18. MEDIEVAL SCULPTURES, RATANPUR, DISTRICT BILASPUR.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey noticed a stone image of twenty-armed Ravana worshipping *ashtamukha* Siva-*linga* assignable to thirteenth century, near second entrance gate inside the fort at Ratanpur. The sculpture is made of purple sandstone and measures 71 X 36 X 24 cm.

19. SCULPTURE, TALA, DISTRICT BILASPUR.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey noticed a rare stone image of Naigamesha (pi. XLA), carrying a chopped *danda* in his right hand and *kartri* in left, lying around Deorani temple. It is assignable to sixth century AD.

20. ROCK-CUT TEMPLES, DHARMARAJ, DISTRICT DHAR.—The Department of Archaeology and Museums, Madhya Pradesh, located a good number of rock-cut temples.

21. PRATIHARA TEMPLE, SAMARKUND, DISTRICT MANDSAUR.—A Siva temple of Pratihara period assignable to ninth century was discovered by B.L. Nagarch of the Temple Survey Project of the Survey. The temple consists on plan of a sanctum, an *antarala* and a *mandapa.*

22. PREHISTORIC ROCK -SHELTER, LEEKI-CHAU, DISTRICT MORENA.—Prehistoric rock-shelters having paintings of different periods were discovered by the Department of Archaeology and Museums, Madhya Pradesh.

23. COPPER-PLATES, SIRPUR, DISTRICT RAIPUR.—A few copper-plates were discovered during clearance of trenches by the Department of Archaeology and Museums, Madhya Pradesh.

24. SIVA TEMPLE, GORAKHPUR, DISTRICT RAISEN.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey discovered ruins of a large Paramara temple assignable to twelfth century AD at Behar. The ruins comprise of door-jambs, flying *bhuta*-brackets, fragments of *gajathara* and pilasters decorated with *chaitya* arches. Besides, stone images of Surya, Vishnu, Brahma and *Nandi,* assignable to eleventh century now kept inside the *mandapa* of a small Devi temple were also discovered by him.

25. RUINS OF MEDIEVAL JAINA TEMPLES, KHARGONE, DISTRICT RAISEN.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey discovered ruins of Jaina temples belonging to tenth-eleventh century AD. The ruins comprise of stone images of Adinatha and other Jaina *tirthankaras,* a pilaster carved with vase-and-foliage motif and *kirtimukhas,* flying *vidyadhara* couples and a *kalasa* crowned by *bijapuraka.*

26. MEDIEVAL JAINA SCULPTURES, MAHALPURAPATHA, DISTRICT RAISEN.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey noticed a colossal broken image of Santinatha at Khonia Karar. Both the hands and legs of the image were found chopped off.

27. SIVA TEMPLE, MALJHIR, DISTRICT RAISEN.—B.L.' Nagarch of the Temple Survey Project (Northern Region) of the Survey located a Siva temple assignable to the Pratihara period near Maljhir on the other side of the hill. The temple, on plan, consists of a sanctum, an *antarala* and a *mandapa.* Architectural and sculptural pieces are found scattered at the site.

28. TEMPLES, MOTALSIR, DISTRICT RAISEN.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey noticed the ruins of two temples assignable to Pratihara period. Of the two, one is dedicated to Siva and the other to Vishnu. Among the ruins include lintels of sanctum doorways, niches containing images often-armed dancing Chamunda, Vishnu in *lalitasana,* standing Harihara, shafts, capitals and brackets of pillars, ceiling slabs, fragments of *sikhara* and an *amalaka.*

29. MEDIEVAL SIVA TEMPLE, NILAGARH, DISTRICT RAISEN.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey discovered ruins of a large temple of Paramaras at Nilagarh amidst forest. It is dedicated to Siva and consists of a sanctum, an *antarala,* a *sabha-mandapa* and an *ardha-mandapa.*

30. INSCRIPTION, MANDI DAMORA, DISTRICT S AGAR.—Phanikant Mishra of the Bhopal Circle of the Survey discovered an inscription in early Devanagari characters carved on a slab of the temple.

31. MEDIEVAL SCULPTURES, BADOH-PATHARI, DISTRICT VIDISHA.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey discovered stone images *of chaumukha* Surya, Surya seated in *padmasana* with his consort, Karttikeya carrying *bijapuraka* and Sakti, Kubera in *lalitasana* with his *nidhis* and Buddha in *bhumisparsamudra* (pi. XLB), all assignable to ninth-tenth century AD.

32. SIVA TEMPLE, SERWASA, DISTRICT VIDISHA.—B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey discovered a temple (pl. XLIA) assignable to ninth century AD. It consists on plan, a sanctum, an *antarala* and a ruined *mandapa.*

33. GUPTA SCULPTURE, TEONDA, DISTRICT VIDISHA.—Bust of a Devi, assignable to sixth century AD was discovered by B.L. Nagarch of the Temple Survey Project (Northern Region) of the Survey.

MAHARASHTRA

34. PALAEOLITHS, ROCK-CUT TEMPLE AND SCULPTURES, DAULATABAD, DISTRICT AURANGABAD.—Ajit Kumar, M. Mahadevaiah, S.S. Parekh and D.N. Sinha of the Aurangabad Circle collected Middle and Late Stone Age tools from north-east area outside the wall of Daulatabad fort. The tool types include scrapers, cherts, blades, bladelets, lunates and fluted cores of chalcedony. B.R. Mani of the same Circle also discovered a medieval rock-cut temple, dedicated to Siva at Daulatabad.

Besides, an image of Garuda seated in *anjali* pose datable to Yadava period was also discovered by S.S. Parekh of the Circle.

35. COPPER-PLATE, PAL, DISTRICT AURANGABAD.—Ajit Kumar of the Aurangabad Circle of the Survey noticed five copper-plates having Persian script in the possession of a villager

36. INSCRIPTION, SCULPTURES AND TEMPLES, CHINCHWAN, DISTRICT BHIR.—Ajit Kumar of the Aurgangabad Circle of the Survey noticed a six-lined Nagari inscription on a slab attached to a step-well, loose sculptures of four-armed Vishnu, *nandi* and *yonipitha,* fragments of architectural members of a temple and hero-stones and four temples, assignable to thirteenth-fourteenth century AD.

37. MICROLITHS AND SCULPTURES, BHANDAK, DISTRICT CHANDRAPUR.—B.R. Mani of the Aurangabad Circle of the Survey collected few microliths, such as blade, fluted cores near the Buddhist caves and six loose sculptures of Jaina *thirthankaras* and other minor deities from the premises of the modern Jaina temple.

38. STONE TOOLS AND FOSSIL, PAPAMIYA-TEKDI, DISTRICT CHANDRAPUR.—B.R. Mani of the Aurangabad Circle of the Survey discovered a wood fossil and a large quantity of stone tools.

39. SANSKRIT MANUSCRIPTS, DHASLA, DISTRICT JALNA.—B.R. Mani of the Aurangabad Circle of the Survey collected a few Sanskrit manuscripts of *Gotranirnaya, Aghoramantra, Mantrasnanasra-vaniupakarma Asuriprayoga, Devimahatmya Ramalaprasna, Ganapatistotra* of *Maharahasya* of *Saradatilaka,* etc. all in fragmentary condition from villagers. These manuscripts are datable to eighteenth-nineteenth century AD.

40. INSCRIBED FRAGMENTARY PILLAR AND ART OBJECTS, TER, DISTRICT OSMANABAD.—B.M. Mehendale of the Ter Museum noticed an inscription carved on a fragmentary pillar and remains of water tank from the ancient site of Ter. The inscription is in Brahmi characters of second century AD. Besides few antiquities, viz., terracotta beads, lamps, bull horse and elephant, handle of conch shell, ivory antimony rod, remains of wheat etc., thirty coins and pieces of red polished ware were also found.

41. SCULPTURES AND TEMPLE, BITALE, DISTRICT SHOLAPUR.—M.R. Dhekane of the Aurangabad Circle of the Survey noticed loose sculptures and a temple assignable to thirteenth-fourteenth century AD. Noteworthy amongst the sculptures are the four-armed Vaishnavi, Gaja-Lakshmi, Ganapati, Vishnu and *nandi.*

42. LOOSE SCULPTURES, BORGAON, DISTRICT SHOLAPUR.—B.R. Mani and M.R. Dhekane of the Aurangabad Circle of the Survey noticed loose sculptures, hero-stones and architectural fragments assignable to thirteenth-fourteenth century AD.

PONDICHERRY

43. BRONZES, TIRUVANDAR KOIL, PONDICHERRY.—While carrying out conservation works at the Panchanandisvara temple, the Madras Circle of the Survey discovered at a depth of 1.20 m, two bronze images, Sivakami Amman and Chandrasekharamurti.

The bronze image of Chandrasekharamurti measures 37 cm X 15 cm and stands in *sama-bhanga* over a pedestal. It is four-armed and holds *a parasu* and *mriga* in the upper hands, while the lower hands are in *abhaya* and *katyavalambita.*

The idol of Sivakami Amman stands in *dvi-bhanga* posture on a pedestal and measures 67 cm x 18 cm. She carries a flower in the right hand while the left hand is in *lolahasta* pose. The image has beautiful *karanda-mukuta* with *siras-chakra* at the back. Stylistically, both the figures are datable to the eleventh-twelfth century AD.

RAJASTHAN

44. MEDIEVAL STONE SCULPTURES, GORAU, DISTRICT NAGAUR.—Sureshwara Nand of the Bikaner Circle of the Department of Archaeology and Museums, Rajasthan, discovered three Jaina images assignable to tenth century.

45. MURALS, DISTRICT PALI.—Prakash Bapna of the Department of Archaeology and Museums, Rajasthan discovered murals at Bala, Chandawal, Rohit, Salidora and Saivari. The murals noticed in these sites range in date from eighteenth century to the recent past.

46. MEDIEVAL SCULPTURES, BARAPALA, DISTRICT PALI.—Vijay Shankar Srivastava of the Depart ment of Archaeology and Museums, Rajasthan, acquired from the village one bronze (ninth century AD) and two stone Jaina sculptures (twelfth century AD).

TAMIL NADU

47. MEGALITHIC SITE, PETHANAICHANPATTI, DISTRICT ANNA.—In the course of his exploration, Dayalan of the Madras Circle of the Survey discovered a megalithic cist burial site on the north-east of the village proper. The cists appear to be of a rare variety as revealed by one of the disturbed burials and found to have consisted of stone circles originally. The orthostats are erected over a huge slab and arranged in *svastika* pattern in anti-clockwise direction. Cist was further bifurcated into compartments by placing another slab in the centre, thus making it a transepted one. The eastern orthostat was provided with two port-holes, obviously one each for the two chambers. These port-holes were further provided with two independent passages, by erecting slabs on either side extending upto one metre from the eastern orthostat and having a width of 60 cm. Besides, a huge pyriform urn about one metre high with a diameter of 1.50 m probably from an urn burial, was also noticed.

48. COPPER AND GOLD OBJECTS, TIRUPULISVARA TEMPLE, VYALUR, DISTRICT CHINGLEPUT.—While carrying out clearance work inside the temple complex for conservation purpose, a gold leaf (rhomboidal in shape), an iron key, a copper coin of the time of Victoria, a stone image of Surya and innumerable inscribed architectural members were discovered by the Madras Circle of the Survey.

49. SCULPTURES, SOMANATHA TEMPLE, MELPADI, DISTRICT NORTH ARCOT.—While carrying out conservation work at the temple, the Madras Circle of the Survey encountered a stone sculpture of Siva (pl. XLI B).

50. COINS, AIRAVATESVARA TEMPLE, DARASURAM, DISTRICT THANJAVUR.—During conservation work near the south western corner of the *tirumadil,* thirty-two copper coins of Chola period were discovered at a depth of 1.90 m. Majority of them depict the popular 'Ceylon man' motif on the obverse, while the reverse bear the legend 'Sri Raja Raja' written in Nagari characters.

UTTAR PRADESH

51. POTTERY, CHURYALI, DISTRICT AGRA.—C.P. Singh and Sushil Kumar Jain of the Agra Circle of the Survey picked up sherds of Painted Grey Ware and Kushana pottery from the mound.

52. FRAGMENTARY SCULPTURE, NAULAKHA, DISTRICT AGRA—C.P. Singh of the Agra Circle of the Survey found a fragmentary sculpture of Vishnu from Naulakha.

53. SCULPTURE, FATEHPUR SIKRI, DISTRICT AGRA.— C.P. Singh and Sushil Kumar Jain of the Agra Circle of the Survey noticed some fragmentary sculptures. Amongst them mention may be made of a head of *yaksha,* and an inscribed pedestal of the Jaina *tirthankara,* Adinatha.

54. TERRACOTTAS, BONE IMPLEMENTS AND POTTERY,, KANNAUJ, DISTRICT FARRUKHABAD.—P.N.Raizada of the Agra Circle of the Survey discovered bone implements, terracotta figurines of Maurya, Sunga-Kushana and Gupta periods and sherds of PGW, NBP, orange, red and black-slipped ware, porcelain and glazed pottery.

55. MOUND, DISTRICT MUZAFFARNAGAR.—P.N. Raizada and C.P. Singh of the Agra Circle of the Survey discovered a mound yielding PGW and medieval pottery.

WEST BENGAL

56. SCULPTURE, MANGALKOT, DISTRICT BARDHAMAN.—The Calcutta Circle of the Survey discov ered an image of Vishnu from the bank of the river Ajoy.

57. SCULPTURES, JANGIPARA, DISTRICT HOOGHLY.—A stone image of Vishnu was discovered by the Calcutta Circle of the Survey. The Department of Archaeology, West Bengal, also collected two early medieval sculptures—two-armed Siva and four-armed Vishnu.

58. SCULPTURE, NAGESWARPUR, DISTRICT MALDA.—An inscribed black stone image of Buddha was reported by the Calcutta Circle of the Survey.

59. IMAGE OF VISHNU, KARIMPUR, DISTRICT NADIA.—The Calcutta Circle of the Survey recovered an image of Vishnu from Karimpur Police Station.

60. IMAGE OF VISHNU, POTTERY AND TERRACOTTAS, DISTRICT SOUTH 24-PARGANAS.—The Calcutta Circle of the Survey received an image of Vishnu from Jainagar Police Station: S.K. De of the Department of Archaeology, West Bengal, collected early historic and medieval pottery and terracottas from Boral near Garia.

61. STONE SCULPTURES AND ARCHITECTURAL PIECES, RAJIVPUR, DISTRICT WEST DINAJPUR.—Twenty stone sculptures and architectural pieces kept inside the compound of Rajivpur Church were examined by the Calcutta Circle of the Survey.

V. RADIOCARBON DATES

The radiocarbon dates measured[1] from archaeological and Quaternary samples[2] are presented in the following pages. The dates were determined at the Physical Research Laboratory, Ahmedabad. All the dates are based on 5730 ± 40 years half-life value of radiocarbon. The year 1950 is the base year to convert these dates into AD/BC scale. All the dates are uncorrected for $^{14}C/^{12}C$ variations.

ANDAMAN AND NICOBAR ISLANDS

1. BEEHIVE, DISTRICT MIDDLE ANDAMAN

PRL-1237. Aragonite shells Shells from southern part of midden, depth 1-2 m below surface Sample No. 1 (shells found along with stone tools and potsherds).	1400 ±100 (AD 550)

2. YARATA NALA, DISTRICT MIDDLE ANDAMAN

PRL-1238. Aragonite Shells Shells from western edge of midden, depth 1-5 m below surface, Sample No. 2 (Shells found along with stone tools and potsherds).	1510+100 (AD 440)

ANDHRA PRADESH

3. CHIGARGUNTA, DISTRICT CHITTOOR

PRL-1187. Old working Charcoal from buried ancient working, depth 40 m. Sample No. CCA-1.	1300±100 (AD 650)
PRL-1188. Old working Half-burnt wood from buried old working, depth 40 m. Sample No. CCA-2.	1080+.100 (AD 870)

[1]Contributed by D.P. Agrawal, Sheela Kusumgar and M. Yadav. For further details of the dated samples, the submitting organizations may be contacted.

[2]Samples submitted by: 1-2, Deccan College, Postgraduate and Research Institute, Pune; 3, MEL, Chigargunta Gold Project, Camp & Post: Sanganapalle, Andhra Pradesh; 4, National Institute of Oceanography, Goa; 5, Gujarat State Department of Archaeology, Ahmedabad/University of Pennsylvaina, USA; 6-7, Geology Department, Panjab University, Chandigarh; 8, School of Geography, University of Oxford; 9, Mangalore University, Karnataka; 10-12, Division of Palynology and Environmental Biology, Bose Institute, Calcutta; 13, Excavation Branch of the Survey, Purana Qila, New Delhi; 14, Department of Ancient Indian History and Archeaology, Visva Bharati, Shantiniketan, West Bengal.

GUJARAT

4. CARLESBERG RIDGE:, ARABIAN SEA

PRL-1257. Calcareous sediment Sediment cores, 50% CaCO3. depth 10-15 cm. Sample No. SK/12/1-2.	28790 +3920 -2650 (26840 BC)
PRL-1258. Calcareous sediment Sediment cores, 50% $CaCO_3$, depth 30-35 cm. Sample No. SK/12/1-3.	24490 +950 -850 (22540 BC)
PRL-1259. Calcareous sediment Sediment cores, 50% $CaCO_3$ depth 35-40 cm. Sample No. SK/12/1-5.	28410 +1490 -1260 (26460 BC) .
PRL-1260. Calcareous sediment Sediment cores, 50% $CaCO_3$. depth 50-55 cm. Sample No. SK/12/1-5.	>31,000

5. ROJDI, DISTRICT RAJKOT

PRL-128L Harappan Charcoal from Trench'46L, Layer 5, depth 140 cm below datum. Sample No. 10483.	363O±110 (1680 BC)
PRL-1282. Harappan Charcoal from Trench 46L, Layer 5, depth 131 cm below datum. Sample No. 10481.	3570±l 50 (1620 BC)
PRL-1283. Harappan Charcoal from Trench 46L, Layer 19, depth 207 cm. Sample No. 10763.	4090±110 (2140 BG)
PRL-184. Harappan Charcoal from Trench 46L, Layer 16, depth 263 cm. Sample No. 10768.	3930±l 10 (1980 BC)
PRL-1285. Harappan Charcoal from Trench 46L, depth 257 cm. Sample No. 10769	3850±150 (1900 BC)

PRL-1087. Post-urban Harappan Charcoal from Trench 45K, depth 244-276 cm. Sample No. 10173.	4130±110 (2180 BC)
PRL-1093. Post-urban Harappan Charcoal from Trench 45K, depth 237-243 cm. Sample No. 10137.	4040±110 (2090 BC)
PRL-1091. Post-urban Harappan Charcoal from Trench 45K, depth 236-244 cm. Sample No. 10148.	4270+110 (2320 BC)

HARYANA

6. MISRI, DISTRICT BHIWANI

PRL-1879. Late Pleistocene Kankar (marl) from depth 90 cm. Sample No. A-7.	4220±120 (2270 BC)

7. BIROHAR, DISTRICT BHIWANI

PRL-1178. Late Pleistocene-Kankar (marl), depth 90-100 cm. Sample No. B-2.4 Birohar.	5270+.120 (3320 BC)

JAMMU AND KASHMIR

8. PROGLACIAL AREA OF KOLAHOI GLACIER

PRL-1121. Younger Moraine Wood protruding from Till. Sample No. Kolahoi I.	150±100 (AD 1800)

KARNATAKA

9. INGALDHAL MINES, DISTRICT CHITRADURGA

PRL-1097. Copper old working Wood, Old mine working. Depth 47 m below surface. Sample No. Ingwood-2.	2070±110 (120 BC)

MANIPUR

10. TAR-ANG VILLAGE

PRL-1224. Quaternary — 1033Q±210
Peat, depth 30-35 cm below surface, middle portion of profile. — (8380 BC)
Sample No. MN/BQTarang.

H.KEIRAK

PRL-1231. Quaternary — >31,000
Peat, depth 10-15 cm, upper portion of the profile. Sample No. MN/4B.

12. LOKTAK POWER CHANNEL

PRL-1225. Quaternary — $15730^{+31\circ}_{-300}$
Peat, depth 140-145 cm below surface, middle portion of the profile. — (13780 BC)
Sample No. MN/BC/77.

UTTARPRADESH

13. HULAS, DISTRICT SAHARANPUR

PRL-1031. Early phase of Late Harappan — 395O±l 10
Charcoal from Trench XH-8, Qd 1, Layer 8, depth 1-36 MBS. Sample No. 11 — (2000 BC)

PRL-1032. Early phase of Late Harappan — 4510±160
Charcoal from Trench XH-8, Qd 1, Layer 8, depth 1-35. Sample No. 12. — (2560 BC)

WEST BENGAL

14. HATIKIRA, DISTRICT BIRBHUM

PRL-119l.Chalcolithic — 2950±120
Charcoal from Trench A, Layer 6, depth 1 -92 cm. — (1000 BC)
Sample No. H/C 6.

PRL-1192. Early Iron Age — 930±100
Charcoal from Trench XA, Layer 3, depth 38 cm. Sample No. H/C 9. — (AD 1020)

PRL-1193. Early Iron Age — 1580±130
Charcoal from Trench XA, Layer 4, depth 66 cm. — (AD 370)
Sample No. H/C 10.

PRL-1194. Early Iron Age Charcoal from Trench XA, Layer 4, depth 66 cm. Sample No. H/C 11.	1520±100 (AD 430)
PRL-1195. Early Iron Age Charcoal from Trench B, Layer 3, depth 81 cm. Sample No. H/C 13.	1260±140 (AD 690)
PRL-1190. Early Iron Age Charcoal from Trench A, Layer 5, depth 120 cm. Sample No. H/C 14.	1340±100 (AD 610)
PRL-1189. Early Iron Age Charcoal from Trench A, Layer 3, depth 80 cm. Sample No. H/C 2.	1440±100 (AD 510)

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done at the Birbal Sahni Institute of Palaeobotany, Lucknow and Deccan College, Post-graduate and Research Institute, Pune.

BIHAR

1. SENUWAR, DISTRICT ROHTAS.—Samples of carbonized grains and wood charcoals have been collected in large quantity from different cultural horizons in the thick deposit representing the neolithic-chalcolithic culture complex. The long duration of human occupation, Period I, has been split up into two sub-periods IA and IB; the main difference between two sub-periods being the total absence of any metal in the former and the presence of copper in the latter. Period I is regarded to date back from *circa* 2,000 to 1,400 BC. The grains from two sub-periods have been identifed as detailed below :

SUB-PERIOD IA : The layer 11-8 revealed rice *(Oryza sativa),* barley *(Hordeum vulgare),* field pea *(Pisum sativum* var. *Arvense),* lentil *(Lens culinaris)* and some millets. In the subsequent upper layers in addition to the material of some kind of dwarf-wheat *(Triticum sphaerococcum),* grass-pea *(Lathyrus sativus),* Kodon *(Paspalum scrobiculatum)* and the seeds of vetch *(Vicia sativa)* which grows as a weed in the winter-crop fields, have also been encountered.

SUB-PERIOD IB : The carbonized grains from layer 7-3 comprise rice *(Oryza sativa),* barley *(Hordeum vulgare),* two forms of wheat viz., dwarf-wheat *(Triticum sphaerococcum)* and bread-wheat (T. Aestivum), kodon *(Paspalum scrobiculatum),* lentil *(Lens culinaris),* field-pea *(Pisum sativum* var. Arvense), grass-pea *(Lathyrus sativus),* chick-pea or gram *(Cicer arientinum)* and green-gram *of moong (Vigna radiata).* Identification of millets, seeds of wild taxa and weeds is still in progress.

MAHARASHTRA

2. TULJAPUR GARHI, DISTRICT AMRAOTI.—Ancient food grains of eighteen species of cultivated and wild plants were recovered. The grain assemblage represents the following plants: Rice *(Oryza* sp. c.f. *Sativa* Linn.); Great millet *(Sorghum Bicolor* Mill sp.); Wheat *(Triticum* sp. c.f. *Aestivum* Linn.); Barley *(Hordeum vulgare* Linn.); Black gram *(Vigna mungo* Linn. Hepper); Green gram *(Vigna radiata* Linn. Wilczed); Black gram/Green gram *(Vigna* sp.); Hyacinth bean *(Dolichos lablab* Linn.); Horse gram *(Dolichos biflorus* Linn.); Lentil *(Lens esculenta* Moench); Grass pea *(Lathyrus sativa* Linn.); Chick pea *(Cicer arietinum* Linn.); Pigeon pea *(Cajanus cajan* Millsp.); Bimley jute/Roselle *(Hibisscus* sp.

[1]Contributed by: 1,6-8 and 11, K.S. Saraswat, D.C. Saini, N.K. Sharma and Chanchala of the Birbal Sahni Institute of Palaeobotany, Lucknow and 2-4, 5 and 9-10, M.D. Kajale and B.C. Deotare of Deccan College, Post-graduate and Research Institute, Pune.

c.f. *Cannabis* Linn, or *Hibiscus* sp. c.f. *sabdariffa* Linn.); Babul, 'Indian Gum Arabic *{Acacia nilotica* (L.) Del.; brassica type *(Brasica* sp.) and the investigations of indeterminate types A and B are yet to be examined.

3. BHAGIMOHARI, DISTRICT Nagpur.—Food grains of following species of plants were recovered through floatation technique from the Megalithic habitation site at Bhagimohari (circa 800-400 BC); Rice *{Oryza sativa* Linn.); Barley *{Hordeum vulgare* Linn.); Wheat *{Triticum* sp. c. f. *Aesthrum* Linn.); Job's tears *(Coix lachryamajonb.);* Lentil *{Lens esculenta* Moench); Grass pea *{Lathyrus sativus* Linn.); Horse gram *{Dolichos biflorus Linn.);* Common bean *{Dolichos lablab* Linn.); Black gram/Green gram *{Vigna* sp.); Red gram *{Cajanus cajan* Mill sp.); Fat hen *(chenopodium* sp. c.f. *Album* Linn.); and Indian jujube *{Zizyphus jujuba* Lamk.).

4. MAHURZARI, DISTRICT NAGPUR.—Results of pollen analysis of five soil samples occurring in association with copper objects (pots, bowls and horse ornaments) excavated during the year 1978-79 at megalithic stone circle site of Mahurzari are being studied with a view to assess the role of copper salts in preservation of pollen and spores. In all the samples fungal spores have been predominantly found and are being diagnosed. The absence of pollen in these samples may be because of their aerobic nature prior to getting filled into the copper objects.

5. NIRGUDSAR, DISTRICT PUNE.—Microfossil assemblage dominated by herbaceous pollen taxa and a few arboreal species from the buried channel fill organic rich alluvial sediments (pH 6.5 and organic matter nearly *2%)* exposed during construction work at Nirgudsar has been retrieved by M.D. Kajale.

The microfossils are dominated in order of intensity of occurrence by morphotypes such as graminoid *non-cerealia, cyperaceous* inaperturate, *chenopodiaceae-amarantaceae,* tricolporate *artemisia,*: tricolporate *brassicaceae, combretaceae, Acacia* types etc. The samples are also rich in fungal spores and fructifications. They are being diagnosed. The microfloral composition speaks in favour of hydrolusical environment dominated by riverine vegetation similar to the one found presently in ponds within braided channels. The sediments also yielded semi-carbonized wood dated to *circa* 39,000 BP on radiocarbon assay. The locality also yielded loosely associated Middle Palaeolithic tools. Thus the detailed pollen analytical investigations are likely to throw important light on the absolutely local riparian vegetational environment prevailing during later part of the late Quaternary period *{circa* 39,000 BP) and witnessed by the Middle Palaeolithic man inhabiting middle reaches of the Ghod Valley.

PUNJAB

6. SANGHOL, DISTRICT LUDHIANA.—The excavations carried out at Sanghol have brought into light the evidence of a rich and varied agricultural economy at the site during the Kushana period (third-fourth century AD). The cereal remains comprise barley *{Hordeum vulgare),* dwarf-wheat *(Triticum sphaerococcum),* bread-wheat *{Triticum aestivum),* cultivated species of rice *(Oryza sativa)* and jowar-millet *(Sorghum bicolor).* The leguminous pulse crops comprise lentil *(Lens culinaris),* field pea

(Pisum sativum Var. *Arvense),* green-gram or moong *(Vigna radiata)* and Kulthi *(Dolichos biflorus).* Besides, large number of fruits and stones of wild ber *(Zizyphys numularia)* were also identified.

UTTAR PRADESH

7. KAUSAMBI, DISTRICT ALLAHABAD.—Charcoals from the following samples were identified :—

TF-220, *Terminalia* sp., Bamboo (KSB I-III-R/D, Locus 3-6, Depth 9'8", Stratum 11).

TF-221, Bamboo (KSB I-III-R/D, Locus 5-7, Depth 14'2" Pit-B.S.B.12).

TF-223, *Terminalia* sp., *Anogeissue* sp., *Soymidafebrifuga,* Bamboo (KSB I-III, Locus 4-5, Depth 7'8", Stratum-Road-II).

TF-225, *Daldergia* sp., Bamboo (KSB IG/R-YZ-3, Locus 1-2, Depth 5'6", Stratum 11). TF-232, *Lagerstroemia* sp, *Anogeissus acuminata,* Bamboo (KSB G/R-YZ-2, Locus 1-3, Depth 1l'4",Stratum-26BK).

TF—233, Bamboo (KSB G/R.-YZ-2, Locus l-3,"Depth 11'7" Stratum-27 BK). *7F-234, Dalbergia* sp,, *Holarrhena antidysenterica,* Bamboo (KSB G/R-YZ-2, Locus 1-3 Depth 12', Stratum-28 BK).

8. NARHAN, DISTRICT GORAKHPUR.—In continuation of the analysis of crop economy from Period III at Mound-2 in the north-east of the village Narhan *(1984-85,* pp. 162-63) the specific identification of wood charcoal collected from different cultural horizons has been carried out. The charcoal remains from Period III *(circa* 600-200 BC) have been identified as belonging to *Pinus rexburghi* (chir-pine), *Tamarindus indica* (tamarind or *imli), Madhuca indica (mahua), Mangifera indica* (mango), *Lagerstroemia parviflora (dhaura* or *asidh), Santalum album* (sandalwood) and bamboo.

Except chir-pinewood and sandalwood the rest are locally available. Chir-pine is a Himalayan species occurring in hill ranges and the sandal trees are found in dry regions of south India i.e. in Mysore, Coorg and the hills of Western Ghats, the Nilgiris and Coimbatore. Thus, chir and sandalwood remains at Narhan suggest rich and varied social and economic background of ancient settlers in Ghagra Valley of Uttar Pradesh.

9. RADHAN, DISTRICT KANPUR.—Carbonized food grains from overlapping phase of Painted Grey Ware and Northern Black Polished ware periods have been identified as barley *(Hordeum vulgare* Linn.), rice *(Oryza sativa* Linn.); and common pea *(Pisum arvense* Linn.). From Gupta period, evidence of rice husk impressions and casts on terracotta cakes have been obtained. The late historical (medieval) levels have yielded definite evidence for barley and rice and a few grains of wheat *(Triticum* sp.) and a single *leguminous cotyledon* of ? lentil *(Lens* sp.).

10. DAMDAMA, DISTRICT PRATAPGARH.—The plant remains were recovered through Water Separation Techniques from habitational site at Damdama. The plant assemblage includes fat hen *(chenopodium* sp. c.f. *Album* Linn.); Purslane *(Portulaca* sp.); and *Polygonaceae, Solanaceae, Labiatae* types. A few indeterminate *graminaceous* types were also noted. A single carbonized and extremely poorly preserved grain of rice has been found but its further details are yet to be ascertained.

11. HULAS, DISTRICT SAHARANPUR.—The carbonized seeds and fruits recovered through archaeological excavations in 1982 at Hulas have brought to light the rich plant economy enjoyed by Late Harappans during 1,700-1,000 BC.

The cereal remains have been identified as rice *(Oryza sativa);* barley *(Hordeum vulgare);* dwarf-wheat *(Triticum sphaeoroccum);* bread-wheat *(T. Aestivum);* club-wheat (T. *compactiim);* oat *(Avena saliva); jowar (Sorghum bicolor);* and finger-millet *(Eleusine coracana).* Remains of pulse crops include lentil *(Lens culinaris);* field pea *(Pisum sativum* var. *Arvense);* grass-pea or Khesari *(Lathyrus sativus),* kulthi *(Dolichos biflorus);* green-gram or *moong (Vigna radiata);* chick-pea or gram *(Cicer aietinum),* a broken seed cons-pea *(Vigna catjang).* Further, a carbonized seed of cotton *(Gossypium arboreum/Herbaceum)* and a few broken pieces of hard seed coat of castor *(Ricinus communis)* in uncarbonized state, are the important discoveries. Among the remains of wild taxa, caryopses of a grass *(Cenchrus ciliaris),* seeds of *Coccinia grandis* which is a wild cucurbit vernacularly known as *'kundru'* and a few broken pieces of the fruits *Hypanthodium* inflorescence in botanical terms, belonging to either *pipal* or *gular (Ficus religiosa F. glomerata)* have been identified.

Furthermore, the hard fruit-shells of almond *(Prunus amygdalus)* and walnut or *akhrot (Juglans ragia)* are the noteworthy finds, suggesting for the first time the inclusion of these dry-fruits in advanced food economy of Harappan culture-complex in Indian sub-continent.

It is also interesting to note here that the burnt mud-plaster pieces have revealed the traces of rice husk used as *degraissant.* On careful examination the husk impressions have been found belonging to the wild rice *(Oryza sativa)* as well.

VII. MUSEUMS

1. GOVERNMENT MUSEUM, AJMER.—The Jaina gallery of the Museum was further extended. The second gallery was repainted and showcases and pedestals repolished.

2. GOVERNMENT MUSEUM ALWAR.—All the galleries were reorganized and labels prepared. A new showcase for the display of art objects was also prepared.

3. ARCHAEOLOGICAL MUSEUM, AMBER.—For better security, collapsible iron gates have been provided. Some of the showcases were improved by adapting scientific methods and lighting arrangements.

4. GOVERNMENT MUSEUM, BHARATPUR.—The lighting arrangements were improved and showcases and pedestals repolished.

5. GOVERNMENT MUSEUM, BIKANER.—Fresh labels were prepared.

6. ARCHAEOLOGICAL MUSEUM, CHANDRAGIRI.—The central hall of the Raja Mahal was provided with false wall of ply wood covered with mat finished laminated sheets. The galleries have been distempered.

7. GOVERNMENT MUSEUM, CHITTAURGARH.—The museum collection is further enriched by acquisition of four Brahmanical sculptures and one inscription. Two new showcases were prepared for display of objects.

8. ARCHAEOLOGICAL MUSEUM, MATTANCHERRY PALACE, COCHIN.—The damaged royal umbrellas and Ambari were restored and displayed. The swing and ivory palanquins, displayed in Gallery 2 and 4 were provided with railings. The swings were also provided with wooden frames on the top. The museum was organized and thrown open to the public. Besides the above, the windows in Gallery 2,3,4 and 5 were also provided with grills for proper security of the art objects, and the niche at the north-east corner of the Key Gallery was also converted into showcase for display of royal headgears.

9. STATE MUSEUM, HYDERABAD.—The museum collection is further enriched by addition of nine sculptures, five postcard sketches by Nand Lai Bose, set of three portraits of Mahatma Gandhi, Tagore and Patel and two thousand one hundred fifty-metal coins. Besides, steps were taken to popularize the museum through All India Radio.

10. GOVERNMENT MUSEUM, HAWA MAHAL, JAIPUR.—For display of exhibits eight new wall showcases were prepared. Besides, forty-nine objects were also added to the museum collection.

11. GOVERNMENT MUSEUM, JAIPUR.—On the occasion of centenary of the Museum, an exhibition of masterpieces of the collection was arranged.

12. GOVERNMENT MUSEUM, JHALAWAR.—Lighting system was improved. In order to prevent light, high temperature, etc., the windows and doors of the galleries were provided with curtain.

13. ARCHAEOLOGICAL MUSEUM, KALIBANGAN.—One hundred and fourteen antiquities belonging to the Harappan period collected from Kalibangan section were accessioned. Besides, Pre-Harappan and Harappan pottery were also acquired. The Gallery 3 of the museum was temporarily organized by providing false ceiling of anti-termite variety tiles and concealed lighting arrangements. Spotlight arrangements to focus attention on important antiquities were also introduced in the gallery of the museum. Gallery 1, 2 and 3 were provided with skylight windows. Besides, five hundred antiquities and plaster cast objects, belonging to Pre-Harappan and Harappan periods were displayed in the table showcases, and one T-shaped wall showcase was also provided in the rear wall of the gallery for display of Harappan pottery and painted jar.

14. ARCHAEOLOGICAL MUSEUM, KONARAK.—During the year under review, the museum acquired two broken pillars.

15. SITE MUSEUM, KANUPARTHI.—Seventy-one loose sculptures of different size and periods scattered in and around the village of Kanuparthi were shifted and displayed in the museum.

16. GOVERNMENT MUSEUM, KOTA.—During the year under review, the display arrangements have been considerably improved.

17. STATE MUSEUM, LUCKNOW.—The museum has enriched its collection by the acquisition of two hundred and thirty objects, viz., sculptures, terracottas, textiles, coins, etc. Noteworthy objects are: upper part of six-handed Durga in stone (sixth century AD), Harihara in buff sandstone (tenth century AD), standing image of two-handed Varuna in buff sandstone (medieval period), human head in clay (Gupta period), all from Allahabad; four-handed Chamunda seated on corpse in buff stone (tenth century AD) from Bareilly; and round clay seal, depicting a man fighting with lion and legend *Sri Rudrasya* in Gupta characters.

18. GOVERNMENT MUSEUM, MADRAS.—Of the new additions acquired as treasure trove, mention may be made of one metal *kavacha* of a deity from Kurichimoolai, ten lamps from Pichankothagam, two fragmentary *prabhavali* from Melanammankurichi, District Thanjavur; and ten stone sculptures-- Dakshinamurti, Devi, Krishna, Hanuman, Nandi, etc., from Mohanur, District Salem.

The museum also received twenty-two metal objects confiscated by Crime Branch, Madras; one metal object each from Tehsildar, Saidapet, district Chingleput and Metropolitan Magistrate, Egmore, Madras; and nine miniature paintings on canvas and other themes from the Survey.

19. MANDLA MUSEUM, MANDLA.—Ninety-seven sculptures and fifteen silver coins were collected from the Forest Department, Supkhar and Mugra village respectively and displayed in the museum.

20. GOVERNMENT MUSEUM, MATHURA.—During the year under review," the museum acquired ninety-two stone sculptures, seven terracottas, seventy paintings, thirteen gold coins, seven hundred and fifty-two silver and copper coins, one copper *tantra* and some other antiquities. The notable among them are: a bust of Surya (pl. XLIIA) in bathstone (tenth century AD); a headless seated image of Jaina *tirthankara* Chandraprabha in buff stone (eighth-ninth century AD); standing image of four-armed Vishnu (pl. XLIIB)in buff sandstones (ninth-tenth century AD); and standing image of Kalyanasundara in buff stone (tenth century AD).

The museum organized seven lectures on 'Indian Arms' by G.N. Pant, 'Importance of Vraja in other literature excluding Puranas' by K.D.Bajpai, 'Importance of Gita at present' by H.L.Maheshwari, 'Contributions of Piprahwa' by K.M. Srivastava, 'Different aspects of Vraja Culture' by Radhey Shyam Dvivedi, 'Ashvaghosha and Mathura' by K.D. Bajpai and 'Mathura art out of Mathura' by S.P. Gupta.

The museum put up three temporary exhibitions 'New arrivals of antiquities', 'Krishna and Sanjhi in paintings', and 'Conservation and preservation of manuscripts'. In addition, Museum Week was celebrated from 10.2.87 to 15.2.87 in the museum.

21. DISTRICT MUSEUM, MORENA.—The museum was organized after collection of sculptures from Dobkhund and neighbouring sites.

22. GOVERNMENT MUSEUM, MT. ABU.—For proper storage of the collection, the building of the museum was further extended.

23. ARCHAEOLOGICAL MUSEUM, NALANDA.—Considerable improvement has been made by replac ing the damaged wooden doors and windows and providing collapsible gates and iron grills to the reserve collection and rewiring of the museum building.

24. NATIONAL MUSEUM, NEW DELHI.—During the year under review the museum acquired twenty-four bronzes, five stone sculptures, forty-nine terracottas, seven clay sealings, three hundred and twenty anthropological objects, one hundred and seventy-one paintings and four hundred and seventeen manuscripts. The noteworthy bronze objects ars seated Buddha (fourteenth century) from western Himalayas; seated Buddha (twelfth century) from Bihar, image *of tirthankara* (thirteenth century) from western India; thunderbolt (fourteenth century) from Tibet and two folk deities (nineteenth century) from Bastar (pl. XLIII A). The stone acquisitions include standing Buddha (second century AD) and Gandhara and Kali (fourteenth century) from central India. The other art objects which deserve mention are *perak* (headgear), *gau* (pendant), ornaments studded with turquoise and coral, silver butter lamps and ladle, portable shrines of silver, brass and copper, mask of skull (pl. XLIII B) ornamented with silver (twentieth century), silver prayer wheel and stupa from Ladakh, Tibet, Nagaland, Arunachal Pradesh and Bastar, a set of Devi Mahatmya (early nineteenth century) from Kangra; Yogini paintings from Bikaner school; a set of forty-four paintings of Patiala school (mid-nineteenth century); and small cloth *patta* from Jagannath Puri.

25. ARCHAEOLOGICAL MUSEUM, ORCHHA.—Sculptures were collected from ancient temples and a period museum organized at Jahangir Mahal.

26. GOVERNMENT MUSEUM, PALI.—A good number of antiquities were acquired and organization of galleries started. The work of laying garden around the museum is in progress.

27. PATNA MUSEUM, PATNA.—The museum acquired one hundred and fifty silver coins of Shah Alam II from Meral Police Station, Palamu.

28. RAMBAN MUSEUM, RAMBAN.—Ten sculptures were acquired and displayed in the museum.

29. GOVERNMENT MUSEUM, UDAIPUR.—The museum acquired six Brahmanical sculptures. The galleries were reorganized by providing new showcases for display of art objects, and old showcases were repainted.

30. BHARAT KALA BHAVAN, VARANASI.—The museum acquired one hundred and sixty-three paintings, twenty-two textiles, twenty-seven minor arts, sixty-nine coins, ninety sculptures and one hundred and nineteen terracottas. Besides, two hundred art objects were also acquired from the personal collection of late Miss Alice Boner and stone tools belonging to prehistoric and chalcolithic periods of western and central India through exchange from Deccan College, Post-graduate and Research Institute, Pune.

31. VIDISHA MUSEUM, VIDISHA.—Two sculptures were collected and displayed in the museum.

VIII. ARCHITECTURAL SURVEY

TEMPLE SURVEY : In continuation of last year's work *(1985-86,* pp. 132-148), the Temple Survey Project (Northern Region) of the Survey under B.L. Nagarch, surveyed the temples of the Paramaras of Mai wa especially falling in the Districts of Dewas, Dhar, East Nimar, Hoshangabad, Indore, Jhabua, Mandsaur, Rajnandgaon, Raisen and Vidisha.

The following temples and remains were taken up for study and survey : Tila Bhandeshvara temple, Bhairon Baba Mandir, Chhotimata, ruins of temples near Padmesvara temple, Hatakesvara Mahadeva temple, Ramesvara Mahadeva temple, Guptesvara Mahadeva temple, Parsvanatha temple, ruins of temples at Padma Kunda and Suraj Kunda, two Siva temples at Koladit, ruins of temples at Harsud, Siva temple at Batakesvara ghat near Harsud, all in District Khandwa; Guptesvara Mahadeva temple at Charwa in District Hoshangabad; Udayesvara temple at Udaipur, and" the temple at Sherwasa in District Vidisha; Amritesvara Mahadeva temple at Sonkach, Gandharvasena temple, ruins of Jaina and other temples at Gandharvapuri, ruins of temples at Devabaloda, ruins of Jaina and two Brahmanical temples at Bhonrasa, Padmini temple, Nilakantha temple, Naga Maharaja-ka-chabutara, temples near Ganesa temple all at Nagda ; Jaina temple and Vijesvara Mahadeva temple at Bijwad in District Dewas; Guptesvara temple at Devguradya, Manglesvara Mahadeva temple and the Jaina sculptures near Chandraprabha temple at Depalpur, Ajitnatha temple at Banadya, Siva temple at Betma, Kevadesvara Mahadeva temple at Kevadesvara, Vishnu temple at Khudel, all in District Indore; the Bhoramdeva temple at Chaura, Siva temples known as Mandwa Mahal and Chhiraki Mahal at Chura, all in District Rajnandgaon; Mahakalesvara temple at Bagh, District Dhar, Devi temple at Malvi near Alirajpur, Siva temple at Baradala and Jaina temples at Lakshmani, all in District Jhabua; Siva temple at Jiran (pl. XLIVA), Devi temple at Bisalwas Kalan, temple ruins at Savana, Chaturbhuja and Narasimha temples at Kanjarada, ruins of Varaha temple at Varahaji, four Siva temples at Barukheda (pl. XLIV B) and temple at Samarkunda, all in District Mandsaur; and temples at Motalsir and Maljhir in District Raisen.

The Bhoramdeva temple at Chaura in district Rajnandgaon was built by Lakshmandeva Ray in AD 1349 during the reign of Naga king Gopaladeva. The *sikhara* of the temple is in *bhumija* style and the temple is notable for the extension of this style of architecture in Chhatisgarh region.

Besides Pratihara temples, the temples of the Gupta period known as Deorani and Jethani temples at Tala and Siva temple at Malhar in District Bilaspur were also studied.

The Kalachuri temples namely Kanti Deval and Mahamaya temple at Ratanpur, Patalesvara Mahadeva temple and Dindesvari temple at Malhar and the Dhumanatha Mahadeva temple at Sargaon, all in District Bilaspur, were taken up for comparative study with reference to the Paramara temples of Malwa.

The sculptures fixed in the walls of the Kalachuri fort at Ratanpur, now kept in a shed and fixed on the walls of the house at Malhar and in the Archaeological Museum, Bilaspur, were also studied.

The medieval sculptures kept in the platform near Balaji temple and fixed in the walls of Hanumana temple near Nagarapalika Office, Jagadalpur and the Siva and Ganga Mai temples at Bastar in District Bastar were also studied. The stone sculptures of Mahavira, assignable to Gupta period, kept in the Bada Digambar Jaina temple and stone images of Bahubali and Adinatha, a lintel showing Parsvanatha on the *lalatabimba* and the niche containing an image of seated Jaina *tirthankara,* all kept in Chhota Digambar Jaina temple and assignable to the tenth century AD at Lakhanadon in District Seoni were also studied.

The Vishnu temple called Chaturbhujanatha and the Jaina temple known as Tamboli-ka Mandir, both located at Sandhara in District Mandsaur and belonging to Pratihara period (ninth century AD) were taken up for comparative study.

The Architecture Survey Project of the Department of Archaeology and Museums, Rajasthan, under O.P. Sharma surveyed and studied the monuments falling in the District of Chittaurgarh. Notable among the remains are: step-well inscriptions (fourteenth century) at Ghosundi, fort (sixteenth century) at Bassi, Siva temple, loose sculptures and pillars (twelfth century) at Khor, *baoli* (sevemeenth century) at Binota, Lakshminarayana temple and Siva temple (seventeenth century) at Begu and Raghunathji temple (early nineteenth century) and Gordhannatha temple.

BUILDING SURVEY : The Building Survey Project under the direction of R.D. Trivedi assisted by Sudhir Kumar, J.B. Chand and C.P. Satsangi surveyed a number of buildings in and outside Delhi.

The palace of Bahadur Shah II, known as Zafar-Mahal in Mehrauli, is an imposing edifice with its three-storeyed red sandstone gateway datable to AD 1847-48. The palace facing north is located within inhabited area and is a remarkable example of the late Mughal palace architecture. Inside the main gateway the passage is flanked by arched cells and some of the cells have remnants of painted borders depicting fruits, floral and other decorative motifs above the arches. The pillars flanking the cells on the ground floor are tapering while those on the upper storey are in pairs. The remains of wooden lintels in the portion of the ceiling suggest that originally it consisted of wooden rafters. Through the left side gateway, an elongated open passage with rooms on both the sides is reached which also contain remains of painted panels below the ceiling. The north-eastern portion of the palace is occupied by a number of graves within an enclosure of *jali* work. The upper storeys of the palace are approached by a flight of steps which are preserved near the gateway complex. A domed pavilion, an open courtyard and remains of rooms can be noticed inside the palace.

The building known as the library of Dara Shikoh in Kashmiri Gate area is notable for its historical and architectural significance. As also attested by the labels inscribed on a marble slab fixed on the boundary wall of the premises, the building housed the library of Dara Shikoh, the son of Shah Jahan. Later on, it served as the residence of the Alimardan Khan, Mughal Viceroy of Punjab in the seventeenth century. During the nineteenth century it was used as the residence of Sir David Ochterlony Bart, the Government College and subsequently District and Municipal Board schools. The central hall of the library has an arched opening flanked by double stone columns, possibly of the time of Dara Shikoh. The wide arch above the stone pillars is enclosed by rectangular panels with a foliage decoration just above the centre of the arch. The stone pillars consist of a pedestal carved with leaf pattern, a round

pot-like member supporting the tapering shaft of the columns surmounted by the square capital. The basement of the building has a number of cells which can be seen on the northern side of the main hall beneath the plinth of the building. In the cells also small tapering pillars, assignable to the seventeenth century, can be noticed. In the beginning of the nineteenth century when the building was occupied by the British, it seems to have undergone considerable alterations and additions to suit, their requirements. The spacious verandah with its huge pillars topped with stylized foliage capitals in brick and plaster indicated the later phase. Another hall on the western side was added in order to use the building as Residency.

The palace of Begum Samru, presently known as Bhagirath Palace, is situated to the north of the main road in Chandni Chowk. At present it is mostly occupied by shops and wholesale market but its southern side still partly retains original form with its platform supporting the massive columns of early nineteenth century. The platform is approached by a double flight of steps on southern side which faced the main road of Chandni Chowk. The huge pillars constructed in *lakhauri* bricks and plaster have square moulded base, round fluted columns surmounted by floral patterns and stylized capital under the lintels. The space above the columns is divided into two parts having a number of mouldings showing dentil pattern and other motifs topped with projecting courses which appear like a cornice. The palace has a basement with arched doorways which have been considerably renovated. It is remarkable that the upper parts of the pillars of this edifice are similar in decoration to those of the later phase of the library of Dara Shikoh. noted earlier.

Besides the Survey work in Delhi, the notable buildings located in the Ranthambor fort in District Sawai Madhopur, Rajasthan, were also surveyed with special reference to residential architecture. The fort situated on an isolated hill in the forest area and has a number of remarkable architectural examples ranging from the thirteenth to the nineteenth century. There are certain architectural and sculptural pieces reused in later buildings which may be assigned to the earlier period, but their actual context is not known. The notable buildings surveyed in the fort include Pachauri Mahal, Hammir Mahal, Badal Mahal, Rani Mahal, pillared *chhatris,* some of them having ancient pillars, etc.

The Hammir Mahal, facing north, is approached through a huge gateway with a prominent locking device. The inner courtyard of the palace is surrounded by verandahs and rooms preceded by massive stone pillars carved with stylized floral patterns at the base, thick shafts consisting of huge blocks of stone surmounted by triple roll brackets. The doorways leading to the side rooms are flanked by square and octagonal pilasters supporting the lintels.

The upper storeys preserved on the eastern side have small courtyards flanked by pillared verandahs and rooms. To the west of the Hammir Mahal lie the remains of Rani Mahal with imposing gateway in spotted red sandstone (pl. XLVA). Originally Rani Mahal seems to have formed part of the Hammir Mahal which was separated by a wall at a later time.

The Pachauri Mahal (pl. XLV B), situated near the Satpole gate, is a moderate double storeyed structure with a closed verandah approached through arched openings on the ground floor and having a projected arched balcony flanked by rooms on the upper storey. In the Badal Mahal there are two big halls which are notable for their decorative plaster work and remnants of paintings on the walls and the ceilings. The hall has four spacious arched openings which were decorated with carved stone panels

as well as paintings surmounting the octagonal double columns. Singh-Ji-ki-Haveli is a three-storeyed building with a courtyard in the middle and pillared verandah and rooms on all the sides. It presents an example of domestic architecture of the period with *its jali* work, arches and decorated windows. The Padmavati temple, also called Annapurna Mandir, is remarkable for its decorated pillared *mandapa* with its balcony intricately carved with stylized *ghata-pallava,* birds, foliage patterns and other decorative motifs.

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

AGRA CIRCLE

Uttar Pradesh

1. AGRA FORT, AGRA, DISTRICT AGRA.—In continuation of last year's (*1985-86,* p. 151) work decayed and damaged moulded floral and geometrical designs in stucco on the southern wall of Shish Mahal were restored and convex glass mirrors refixed matching the original. The walls and ceilings of the Diwan-i-Am complex have been replastered with special mortar and the roof terrace on the south western *dalan* concreted. Depressed and worn-out stones on the top of the rampart running from Amar Singh gate to Diwan-i-Am were replaced with new ones and open joints pointed. The work of underpinning and replastering of the fortification wall was also attended to. The decayed *kanguras* were restored as per the original. Decayed and dead concrete roof terraces of the Khas Mahal, Diwan-i-khas and Angoori Bagh were removed and reconcreted. The walls of Angoori Bagh were replastered.

2. JAMA MASJID, AGRA, DISTRICT AGRA.—In continuation of last year's (*1985-86,* p. 151) work of restoration of the north-western minaret of Jama Masjid was taken up and completed by casting of pedestals with reinforced cement concrete and inner core with brick tiles and steel reinforcement and veneering of red sandstone above the core and inlay work with black and white marble matching the original.

3. RAM BAGH GATEWAYS, AGRA, DISTRICT AGRA.—Worn-out stones, *dasas,* pillars and pillar bases were removed and replaced with new ones. Moulded lime plaster on the plinth of causeways was also replaced.

4. TAJ MAHAL, AGRA, DISTRICT AGRA.—Weathered and worn-out lime plaster on walls of corridors of Shish Mahal was removed and replastered as per original. The marble panel with black inlaid Arabic letters on each lateral wall in the cenotaph chamber have been changed and yellow and black marble bars of border were also replaced.

In continuation of the last year's (*1985-86,* pp. 151-52) work, repair to the first tier of the south-western minaret was resumed. Decayed and damaged marble blocks of brackets, *chhajja,* railing, veneering and those of gardens, as well as worn-out black inlaid bars were replaced with new ones. The resetting of dislodged marble, stone *chhajjas* and railings of the second and third storeys were also attended. Decayed mould plaster of the *chhatri* has been stripped off and disturbed veneer stones on the outer face of both the storeys were reset and watertightened as per original.

Weathered and decayed sandstone *jalis* and railings of the plinth of the main mausoleum at the

river side and flagstones of the floor in front of the main entrance gateway were replaced with new ones and open joints of the pathways from the main entrance gateway to the main mausoleum pointed.

The repair of the south-western *chhatri* of the Fatehpuri Mosque was also taken up; dislodged stones of veneering were reset, missing stones restored and decayed stone of *chhajjas* and of the main facade were replaced with new ones. Cracks on the roof terrace were filled up with tarplastic compound and lime mortar.

5. FATEHPUR SIKRI GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.—Wom-out and decayed stones of the top walls of Sweet Tank and those of flights of steps were replaced with new ones and interior replastered with lime and cement mortar mixed with waterproofing compound. Worn-out and decayed flagstone flooring of the courtyard, corridors and those of cloisters of the Jama Masjid were replaced with new ones. Recessed pointing of piers, string courses, ceilings of cloisters and brackets towards Buland Darwaza was executed with saturated cement mortar. Dead and decayed plaster of kiosks and parapet was removed and replastered. Missing stones of pinnacle of the southern dome were restored.

Missing carved *dasa* stones on the east side of Islam Khan's tomb were restored and sunken stones of the floor reset. The damaged wooden canopy and its columns inlaid with mother-of-pearls at the cenotaph in Sheikh Salim Chisti's Tomb were chemically treated.

6. DELHI GATE ON THE AGRA-MATHURA ROAD, AGRA, DISTRICT AGRA.—The outer walls and gates were underpinned and replastered.

7. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—The damaged railing stones of the staircase of the second storey have been replaced with new ones.

8. JAGESVARA TEMPLE, PHULAI GUNTH, DISTRICT ALMORA.—Bulged out and collapsed dry stone masonry of the compound wall have been restored.

9. SURYA TEMPLE, KATARMAL, DISTRICT ALMORA.—Bulged out and collapsed portions of *the jangha* and *sikhara* of northern and western facades were dismantled and reset and moulded corners of the *sikhara* reproduced.

10. REMAINS OF SIXTEEN TEMPLES, ADBADRI, DISTRICT CHAMOLI.—The retaining wall of the *bhogashala* was underpinned and replastered and roof repaired.

11. BASDEO AND JOGESVARA TEMPLES, PANDUKESHWAR, DISTRICT CHAMOLI.—The decayed and worn-out wooden rafters of the roof of the *mahamandapa* of Basdeo temple and wooden rafters of the canopy of Jogeshwar temple were replaced with new ones.

12. SITA RAMJI'S TEMPLE, SORON, DISTRICT ETAH.—In order to check the soil erosion, a retaining wall in stone masonry was constructed in front of the temple.

13. MOSQUE AND TOMB OF MAKHADUM JAHANIAN, KANAUJ, DISTRICT FARRUKHABAD.—Loose and decayed stones of the back wall of the tomb were taken out and replaced with new ones. The roof-terrace was concereted. The eastern retaining wall was underpinned.

14. MOSQUE AND SARAI, KHUDAGANJ, DISTRICT FARRUKHABAD.—The back wall of the mosque was underpinned, pointed and replastered and the courtyard concreted and arches replastered.

15. TEMPLE OF MADAN MOHAN, BRINDABAN, DISTRICT MATHURA.—The fallen-out patches of the " retaining wall on the eastern side of the temple was underpinned and pointed (pl. XLVI). The cavities of the open joints of *chhajja* of the *jagamohana* were filled up and recessed pointing done. Eastern facade was replastered and the roof of *the jagamohana* concreted.

AURANGABAD CIRCLE

Maharashtra

16. TEMPLE OF MALLIKARJUNA, GHOTAN, DISTRICT AHMADNAGAR.—The uneven and displaced stones of the courtyard have been reset with proper slope in combination mortar as per original. The east side compound wall was recess-pointed followed by a coping on top. The south side surroundings was improved by removing accumulated debris and dressing the area.

17. CAVES, AJANTA, DISTRICT AURANGABAD.—A stone masonry retaining wall was constructed infront of the booking counter for the reclamation of more space to avoid jumbling of tourists infront of counter.

18. TOMB OF RUBIA DAURANI (BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—In continuation of last year's work *(1985-86,* p. 154) the north-east minaret was given final coat of plaster. The missing ornamental and floral designs of the vertical band at north-west corner of the main tomb were reproduced in plaster as per original.

19. ROCK-CUT CAVES, AURANGABAD, DISTRICT AURANGABAD.—The swelled-out and fractured stone masonry wall of the staircase leading to Cave 9 was reconstructed and plastered maintaining the consistency in colour and texture of the adjacent rock.

The caved-in wall portion of Cave 8 was underpinned and plastered with toned mortar in conformity with the rock surface after scooping out the disintegrated rock.

20. DAULATABAD FORT AND MONUMENTS, DAULATABAD, DISTRICT AURANGABAD.—Two bastions of the south outer and inner fortification wall were dismantled and reconstructed in combination mortar using old stones after proper redressing followed by battlements on top as per the original. The south side breaches of the outer fortification wall were made good with stone masonry. The partly missing original stepped approach through the rock-cut moat to the subterranean passage was restored with stone masonry as per original.

21. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The ashlar masonry pillars of facade of Cave 16 and weathered portions of Caves 16(b), 17,18, and 23 were dismantled and restored in R.C.C. and finished with cement plaster matching with the pattern and texture of adjacent original pillars.

The XPM provided to the openings of the southern cell of Cave 16 were replaced with imitative perforated R.C.C. *jalis* adopting the original pattern available. The partly missing ceiling, lintels and wall of Nandi *mandapa* of Cave 22 were restored in R.C.C. in conformity with the adjacent rock surface. In continuation of previous year's work the missing piece of octagonal >'as/i/i and part of pedestal with *devakoshtha* of the *manastambha* of Cave 32 were restored in concrete using stainless steel reinforcement. The top and bottom surface of the first two fallen pieces was levelled properly by chiselling and a hole was provided to accommodate pin and epoxy concrete to strengthen the bond between two pieces. The similar treatment was given to the bottom portion of the third piece. These three pieces were lifted one by one and mounted one over the other with the help of crane and the fallen *manastambha* was re-erected as per original.

22. SION FORT, SION, DISTRICT BOMBAY.—In continuation of last year's work (*/ 985-86,* p. 155), the plastering of the inner and outer faces of the walls of the Portuguese water tower in combination mortar was taken up and completed.

23. LAKHUJI JADHAVARO'S CHHATRI, SINDKHEDRAJA, DISTRICT BULDANA.—The displaced stone around the *samadhi* were reset in their proper position in combination mortar and temple-type wooden door was provided.

24. CITY WALLS AND GATES, CHANDRAPUR, DISTRICT CHANDRAPUR.—The work of restoring the breaches of the fort wall using old stones in combination mortar is in progress.

25. PATANADEVI TEMPLE, PATANA, DISTRICT JALGAON.—The dilapidated and fallen retaining wall of the temple was dismantled and reconstructed up to the plinth level and further work is in progress.

26. RAYGAD FORT, RAYGAD, DISTRICT RAYGAD.—The dilapidated and out-of-plumb walls of Shop 1 and 43 of Bazar Beth were dismantled and restored in random rubble masonry in mud mortar as per original.

27. FORT AND OLD PORTUGUESE REMAINS, BASSEIN, DISTRICT THANE.—The inner faces of the wall of Holy Name of Jesus Church were recess pointed in combination mortar. The dilapidated bastion near the land gate was restored followed by a parapet wall on the top in combination mortar. The missing stone pavement was also provided as per the original. Underpinning has been done with stone masonry in combination wall from main entrance to the land gate, and the wall was reconditioned.

BHOPAL CIRCLE

Madhya Pradesh

28. OLD FORT, LANJI, DISTRICT BALAGHAT.-The work of restoration of the collapsed portion of the fort wall has been taken up and is in progress.

29. KAMLAPATI MAHAL, BHOPAL, DISTRICT BHOPAL.—The old and worn-out unserviceable electric wiring and fittings have been replaced with new wiring and fittings. The arched openings were provided with M.S. grill. The work is in progress.

30. MATANGESVARA TEMPLE ,KHAJURAHO, DISTRICT CHATTARPUR.—Approach road to Matangesvara temple, Jardine Museum and Sub-circle office was concereted.

31. OLD TEMPLE, KODAL, DISTRICT DAMOH.—C.R. stone masonry compound wall was restored on old traces in lime mortar. The work is in progress.

32. BIR SINGH PALACE, DATIA, DISTRICT DATIA.—The deteriorated roof concrete was removed and relaid with fresh lime concrete to make terraces watertight. The area was enclosed with G.I. barbed wire fencing to check the encroachment. The work is in progress.

33. BIR BAHADUR'S PALACE, MANDU, DISTRICT DHAR.—Missing and damaged steps and floor of tank have been replaced with fresh fine chiselled and dressed lime stone over fresh lime concrete. The damaged and missing random rubble stone masonry wall has been restored and watertightened. An angle iron gate has also been provided in the main entrance to check misuse of the area:

34. JAHAZ MAHAL, MANDU, DISTRICT DHAR.—The damaged and missing steps of the upper tank and apron at ground floor have been replaced with fine chisel dressed limestones. The decayed concrete of the roof has been removed and provided with fresh lime concrete and watertightened. The work is in progress.

35. KAPOOR TALAO, MANDU, DISTRICT DHAR.—Missing and damaged enclosure wall in R.R. stones masonry has been repaired and the settled debris inside the tank and along the enclosure wall was removed. The work was in progress.

36. PALACE COMPLEX, MANDU, DISTRICT DHAR.—The missing and damaged paving stones of the tank have been replaced with new fine chisel dressed limestones. The old deteriorated, damaged and missing floor has been dismantled and relaid in fresh lime concrete. The damaged and robbed walls have been restored in R.R. stone masonry and watertightened and the accumulated debris removed.

37. BUDDHIST CAVES 1 TO 7, BAGH, DISTRICT DHAR.—In continuation of last year's work, three R.C.C. pillars have been constructed by replacing the old deteriorated and damaged rock cut ones. The damaged rock cut beams and slabs of Cave 4 were also replaced by R.C.C. The air gap between R.C.C. slab and the concave ceiling has been filled with empty inverted earthen pitchers as done earlier to avoid impact of falling chunks. Cement concrete has been laid on the roof of Caves 4, 5 and 6 to make it watertight followed by a layer of lime concrete thereon.

38. SOMVATI KUND, MANDU, DISTRICT DHAR.—In continuation of last year's *(1985-86,* p. 161)

work, the bulged out and deteriorated side walls of the tank, facing Darya Khan's tomb and mosque have been restored with fine chisel-dressed stones in conformity with the original pattern. The work is in progress.

39. BADAL MAHAL GATEWAY, CHANDERI, DISTRICT GUNA.—In continuation of last year's *(1985-86,* p. 161) work, the approach path has been paved with flagstone and the area has been enclosed with barbed wire fencing on angle iron posts to check encroachments.

40. KHIRKI GATE, CHANDERI, DISTRICT GUNA.—Deteriorated and missing portions of Khirki gate and the adjoining wall was restored in C.R. stone masonry on original traces.

41. KOSHAK MAHAL, CHANDERI, DISTRICT GUNA.—The missing veneer stones of the facade were provided with fine chisel dressed ashlar stones matching the original. The work is in progress.

42. PAKHAN GATE, CHANDERI, DISTRICT GUNA.—The dislodged and the robbed portions of the Pakhan gate and adjoining wall have been restored on original traces in C.R. stone masonry and made watertight.

43. PALACE INSIDE FORT, CHANDERI, DISTRICT GUNA.-The debris of the fallen portions of the palace has been removed and the damaged and missing walls of the palace restored.

44. SINGHPUR PALACE, CHANDERI, DISTRICT GUNA.—The work of replacement of flagstone flooring of display galleries in the ground floor has been taken up and is in progress.

45. GWALIOR FORT, GWALIOR, DISTRICT GWALIOR.—The damaged and missing stone slabs, beams, *chhajjas* and *dasas* of the *baoli* of the Assi Khamba have also been replaced with new fine chisel dressed stone slabs matching the original. The work is in progress. The deteriorated and damaged facing stones of bastion of the Hathipole gate have been replaced with fine chisel dressed ashlar stones and the dome watertightened. The work is in progress. The damaged and missing rear fort wall has been restored in C.R. stone masonry and watertightened. The old decayed and damaged" plaster of all the rooms has been raked out and replastered. The arches of rear galleries have been closed with chisel dressed C.R. stone masonry with fine joints and the arched portions is provided with M.S. grill.

46. MAN SINGH'S PALACE, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's *(1985-86,* p. 162) work, the chiselling of mother rock for the foundation of retaining wall to Bastion 3 was resumed. The old decayed roof concrete was dismantled and relaid with fresh lime concrete to make the roof terrace watertight. The work is in progress.

47. SAS BAHU TEMPLES, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's *(1985-86,p.* 162)work, the structural joints of the temples have been sealed off with toned mortar and watertightened. The area is enclosed with G.I. barbed wire fencing on angle iron posts with M.S. gate and wicket gate.

48. TELI KA MANDIR, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's *(1985-86,* p. 162) work, the damaged, broken and sunken flag stones of the platform around the temple were dismantled and relaid with flagstone flooring over lime concrete bed. The work is in progress.

49. TOMB OF MOHAMMAD GHAUS, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's *(1985-86,* p. 162) work, the damaged and missing stone *jalis* were replaced with fresh ones as per the original.

50. TOMB OF TANSEN AND ADJOINING MOSQUES, GWALIOR, DISTRICT GWALIOR.—In continuation of last year's *(1985-86,* p. 162) work, the damaged and missing flag stones have been replaced with fresh flagstones. The walls of mosque have been underpinned and roof terrace also made watertight.

51. TEMPLE OF CHOUSATH YOGINI, BHERAGHAT, DISTRICT JABALPUR.—Restoration of stone masonry pedestal of the temple is in progress.

52. VISHNU VARAHA TEMPLE, BILHARI, DISTRICT JABALPUR.—The old damaged and sunken stone flooring has been replaced with new stones.

53. SOMNATH TEMPLE, BURGAON, DISTRICT JABALPUR.—The bulged out and damaged plinth of the platform has been restored in plumb. The platform has been paved with stone flooring.

54. VISHNU VARAHA TEMPLE, KARITALAI, DISTRICT JABALPUR.—The accumulated debris around the temple was removed and sculptures and temple remains exposed. The area was levelled and dressed after removing surplus earth outside the area. The work is in progress.

55. JAMI MASJID, ASIRGARH, DISTRICT KHANDWA.—The cavities have been underpinned and damaged and missing wall restored in R.R. stone masonry in lime mortar.

56. AHUKHANA, BURHANPUR, DISTRICT KHANDWA.—The work of grouting of cracks, restoration of bulged out, damaged and missing wall in stone masonry has been taken up and is in progress.

57. RUINED PALACE, BURHANPUR, DISTRICT KHANDWA.—The damaged and missing stone masonry of the outer wall has been restored in lime mortar.

58. MAHAKALESVAR TEMPLE, UN, DISTRICT KHARGONE.—The area is enclosed with stone masonry dwarf wall mounted with G.I. barbed wire fencing on angle iron post to check encroachments.

59. PARVATI TEMPLE, NACHNA-KUTHARA, DISTRICT PANNA.—Dislodged, bulged out and out-of-plumb cut stone masonry of the plinth of platform has been removed and resetting work is in progress.

60. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.—In continuation of last year's *(1985-86,* p. 162) work; the damaged, sunken and missing cut stone flooring has been replaced with new fine, chisel dressed cut stones laid with fine joints.

61. BUDDHIST MONUMENTS, SANCHI, DISTRICT RAISEN.—In continuation of last year's *(1985-86,* pp. 162-63) work, the damaged and missing Gupta style brick tiles provided in floor of Monastery 51 were replaced with new ones as per original. The work of paving approach path leading to Stupa 1 and 3 and old museum building with flagstone remained in progress.

62. BUDDHIST STUPAS, SONARI, DISTRICT RAISEN.—The dislodged Stupa 3 and 4 were restored and tops watertightened.

63. TEMPLE, BAMODA, DISTRICT SAGAR.—In continuation of last year's *(1985-86,* p. 163) work, the damaged and missing stone flooring has been replaced with new cut stone and the *sikhara* watertightened.

64. TOMB AND MOSQUE OF BALJATI SHAH, DHAMONI, DISTRICT SAGAR.—The bulged and out-of-plumb wall of the platform has been restored and the floor of the platform concreted.

65. TEMPLE, ASHTA, DISTRICT SEONI.—In continuation of last year's *(1985-86,* p. 163) work, the platform has been provided with flagstone flooring and *sikhara* watertightened.

BHUBANESWAR CIRCLE

Madhya Pradesh

66. MAHADEO TEMPLE, BASTAR, DISTRICT BASTAR.—The protected area has been fenced with barbed wire.

67. KAMMA MEMORIAL OR URASAGATTA POST, DHILMILI, DISTRICT BASTAR.—The unique wooden pillar known as Kamma Memorial has been provided with pillared R.C.C. roof and the area fenced.

68. MEGALITHIC SITE, GAMMEWADA, DISTRICT BASTAR.—The protected area around the megaliths has been fenced.

69. NARAYAN TEMPLE, NARAYANPAL, DISTRICT BASTAR.—The area has been levelled and beautified and fenced with barbed wire.

70. BRICK TEMPLE OF SAVARI, KHAROD, DISTRICT BILASPUR.—The outer courtyard was levelled by providing stone paved floor to avoid stagnation of rain water all around the foundation.

71. PALI STONE INSCRIPTION, SAMARSAL, DISTRICT BILASPUR.—The area around has been fenced and levelled. In order to display the rare Pali inscriptions, a small exhibition hall has been constructed.

72. SIVA TEMPLE, DEOBALADA, DISTRICT DURG.—The *nandimandapa* has been restored. G.I. pipe railing has been provided all around the existing pond.

73. JAIN TEMPLE, ARANG, DISTRICT RAIPUR.—Surroundings of the temple have been provided with stone pavement to stop stagnation of rain water.

74. SATI PILLAR, DEVARBIJA, DISTRICT RAIPUR.—The exquisitely carved monolithic column has been provided with R.C.C. roof.

75. TEMPLE COMPLEX, SIRPUR, DISTRICT RAIPUR.—The missing walls of the damaged temple complex have been restored as per original brickwork.

Orissa

76. ANCIENT BUDDHIST SITE, LALITAGIRI, DISTRICT CUTTACK.—Renovation work of stupa which yielded the valuable relics is in progress. An approach road connecting the village main road has been built.

77. ANCIENT SITE, UDAYAGIRI, DISTRICT CUTTACK.—Conservation work of the brick stupa is in progress. A sculpture-shed for keeping the loose sculptures has been constructed.

78. ANCIENT SITE, RATNAGIRI, DISTRICT CUTTACK.—In order to avoid stagnation of rain water and overgrowth of vegetation, the area in front of the monastic complex has been paved with stone flooring.

79. DAKSHA PRAJAPATI TEMPLE, BANPUR, DISTRICT PURI.—Reconditioning of the existing outer and inner compound wall, adding colour wash to the smaller shrines in the complex, providing the grill gate and other beautification work have been done.

80. BRAHMESVARA TEMPLE COMPLEX, BHUBANESWAR, DISTRICT PURL—Watertightening, providing stone pavement all around the two existing temples on the southern side of the temple complex were attended. The work of restoration of the steps and platforms around the tank on the north side of the temple complex is in progress.

81. LINGARAJA TEMPLE COMPLEX, BHUBANESWAR, DISTRICT PURL—The uneven and badly damaged floor of the Lingaraja temple has been taken up for levelling and changing of the worn-out stone slabs. The front floor just after entrance to the complex and the southern side passage upto the Ganesa shrine has been restored. The badly worn-out lower portion of the temple has been replaced by new carved stones.

82. NAVAKISHORE TEMPLE, BHUBANESWAR, DISTRICT PURL—The dilapidated small shrine of the Navakishore temple has been dismantled and reset in its proper place after replacing the missing architectural members. A grill gate has been provided to the main temple and the surroundings improved by levelling and conditioning of undulated surface.

83. PARASURAMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The southern side of the com pound has been fenced and the existing damaged compound wall has been reconditioned. A long hume pipe drain has been provided to keep the temple free from stagnation of water during monsoon.

84. SIDDHESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—Missing boundary wall of the Siddhesvara temple has been restored as per original.

85. UDAYAGIRI-KHANDAGIRI ROCK-CUT CAVES, BHUBANESWAR, DISTRICT PURL—The area in front of Barabhuj Jaina cave and the residential complex has been fenced.

86. VAITAL DEUL, BHUBANESWAR, DISTRICT PURI.—The damaged roof slabs of the *mukha-mandapa* has been removed 1)y replacing the broken ones and the roof watertightened.

87. VARAHI TEMPLE, CHAURASI, DISTRICT PURL—Watertightening of the temple and beautification of surroundings has been completed.

88. ASOKAN ROCK EDICT, DHAULI, DISTRICT PURL—Fencing of the site has been completed with barbed wires, and a turnstile gate in stupa design has been provided. Steps leading to the Asokan edict have been widened and provision of two leaf gate has been made for entering into cell.

89. SUN TEMPLE, KONARAK, DISTRICT PURL—The restoration of the missing parapet wall on the front side and the steps on the south, north and east side has been taken up (pl. XLVII) and the work is in progress.

90. JAGANNATHA TEMPLE COMPLEX, PURI, DISTRICT PURL—The deplastering work of the Jagannatha temple on springing level all around upto three metres has been completed and conserved. Deplastering of the Narasimha and Surya temples has been completed. The roof of Kurmibeda on western and northern side has been changed and relaid as per original. The missing roof of the Bara Bhai Hanuman as well as Dadhi Vamana has been replaced and restored.

CALCUTTA CIRCLE

West Bengal

91. JOR MANDIR, BISHNUPUR, DISTRICT BANKURA.—The damaged and almost washed-out earthen platform on the north-west corner and northern side have been refilled and the top consolidated by laying laterite-stone boulder by pitching and filling the joints with cement mortar. The work of watertightening of the top has also been completed.

92. NANDA LALA TEMPLE, BISHNUPUR, DISTRICT BANKURA.—The fallen eastern facade of the temple has been completely restored with decorative laterite-stone masonry matching the original. The missing

and damaged portions of the lime terracing of the roof have also been relaid (pl. XLVIII). Missing portions of the barbed wire-fencing and the angle-iron posts have been provided.

93. RADHA-MADHAVA TEMPLE, BISHNUPUR, DISTRICT-BANKURA.—The damaged south-west portion of the gateway of the temple alongwith ornamental brick work has been restored as per originals (pl. XLIX).

94. RASAMANCHA, BISHNUPUR, DISTRICT BANKURA.—The fallen roof of the vaulted chambers along side the north and west has been completely restored with specially prepared brick and cement mortar matching the original. Lime terracing has also been done as per original on the remaining vaulted roof.

95. RATNESVARA TEMPLE, JAGANNATHPUR, DISTRICT BANKURA.—The protected area around the temple has been fenced. The missing and damaged steps on the north side of the main entrance have been repaired with brick masonry. The loose and sunken floor of the main temple on east, west and north has been relaid.

96. TOMBS OF BAHRAM SAKKA, SHER AFGHAN AND NAWAB QUTBUDDIN, BARDHAMAN, DISTRICT BARDHAMAN.—The eroded top concrete of the tomb of Sher Afgan has been relaid in cement concrete to stop leakage of water. The main dome of the tomb of Bahram Sakka has been properly grouted and the joints have been pointed.

97. LALJI TEMPLE, KALNA, DISTRICT BARDHAMAN.—Lime terracing on the floor and roof has been completed. Brickwork and plastering of the walls have also been completed along with the uprooting of deep rooted trees. Repairing of wooden doors has been done.

98. RUPESVARA TEMPLE, KALNA, DISTRICT BARDHAMAN.—Lime terracing has been done on the basement. The work of renewing plain and ornamental brickwork has been completed along with the plastering of the walls.

99. SIVA TEMPLE, KALNA, DISTRICT BARDHAMAN.—Lime terracing on the roof has been done alongwith the renewing of plain and ornamental brick-work wherever necessary.

100. COOCH BEHAR PALACE, COOCH BEHAR, DISTRICT COOCH BEHAR.—To stop leakage of water, aluminium sheet has been provided over a base of cement concrete after fixing wooden rafters on the missing portion of the main dome. Glass panes of various sizes have been fixed on the doors and windows of the palace which were damaged earlier by cyclone. Broken wooden panels of the doors of the verandah have been repaired and fixed. Missing brass fittings of doors and windows of some rooms on the first floor and rooms on the ground floor have been fixed. Replastering has been done on the decayed portions of the walls of the Darbar Hall. Moss and lichen on the main arches of the Darbar Hall have been eradicated followed by colour washing on the southern portion. The decorated wooden door of the main entrance damaged by cyclone has been repaired and fixed. Lime concrete of the portico has been consolidated. To prevent ingress of water due to heavy rains, brick-masonry wall has been constructed to close the openings which are not needed.

101. BARADARI MASJID OR THE GREAT GOLDEN MOSQUE, GAUR, DISTRICT MALDA—Barbed wire fencing of the compound has been repaired along with the repairing of the concrete floor. The damaged and porous lime-terracing on the roof has been removed and relaid.

102. CHIKA MASJID, GAUR, DISTRICT MALDA.—The roof has been concreted and *pucca* drain provided for the outlet of stagnant rain water. Iron gates have also been provided at the entrances.

103. LOTTON MASJID, GAUR, DISTRICT MALDA.—The missing portions of the outer surface of the western ornamental brick wall have been restored as per original. Damaged floor of the mosque inside has also been relaid properly. Loose barbed wire fencing has been tightened by providing new wire wherever necessary. An iron gate has also been provided at the entrance of the monument.

104. QADAM RASUL MASJID, GAUR, DISTRICT MALDA.—The decayed plaster of the entrance gateway has been removed and replastered wherever necessary. The missing brickwork on the walls of the *mehman-khana* and the mosque have been properly restored as per original. Damaged floor has also been relaid. The loose and damaged lime-terracing above the roof has also been removed and relaid as per original.

105. ADINA MOSQUE, PANDUA, DISTRICT MALDA.—The damaged and missing stone masonry of the northern boundary wall has been repaired as per original. The top of the brick masonry wall has been watertightened to stop leakage of water and decay.

106. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD.—In continuation of the last year's *(1985-86,* p. 167) work, the replacing of worn-out beams and *burghas* has been completed. The damaged marble stones on the floors of the palace have also been replaced. In order to facelift the palace roads and pathways on the front side has been relaid with cement lime mortar. The front portion of the outer wall of the palace has also been washed with Snowcem colour as per original. Doors and windows of the same side have also been repainted as per original. As a security measure, all the entrances on the outer side of the palace have been closed with iron grills and *jalis.*

107. TOMB AND MOSQUE OF MURSHID QULI KHAN, SABJIKATRA, DISTRICT MURSHIDABAD.—Lime concrete pathway around the monuments has been provided to facilitate the movement of visitors.

CHANDIGARH CIRCLE

Haryana

108. SURAJ KUND, LAKHARPUR, DISTRICT FARIDABAD.—The resetting work of the ramp of the tank on the entrance side has been completed in random rubble masonry with lime cement mortar. The dislodged steps were also reset and pointed.

109. RUINED QILA, HANSI, DISTRICT HISSAR.—The repairs to the fallen patches of brick masonry of

the Ghora Ghar and mosque have been completed. The accumulated debris was removed from the mosque.

110. KOS MINAR, KARNAL, DISTRICT KARNAL.—The repairs to Kos Minar was attended to by underpinning, plastering and also reconstructing the fallen and bulged out platform.

111. RAJA KARAN-KA-QILA, THANESAR, DISTRICT KURUKSHETRA.—In order to avoid further encroachment, the protected area has been fenced with barbed wires and M.S. iron angles.

112. JAL MAHAL, NARNAUL, DISTRICT MAHENDRAGARH.—The decayed concrete of the floor has been removed and replaced with lime cement concrete. Small patch works were also attended to by plastering and pointing.

Punjab

113. RAM BAGH GATE, AMRITSAR, DISTRICT AMRITSAR.—The old and decayed plain and ornamental plasters on the outer *eastern jharokha* has been removed and replastered. Lime cement concrete flooring of the gateway, side verandahs and rooms has been provided after demolishing the decayed, pulverized and unequal surfaces. The work is in progress.

114. FORT, BHATINDA, DISTRICT BHATINDA.—Reconstruction of the fallen eastern outer bastion (EOB-5) of the Fort has been taken up and work is in progress.

115. TAKHT-I-AKBARI, KALANAUR, DISTRICT GURDASPUR.—The fencing of the protected area has been taken up by providing brick masonry walls on three sides. The work is in progress.

116. DAKHNI SARAI INCLUDING GATEWAY, JALANDHAR, DISTRICT JALANDHAR.—The plaster patches of the western gateway have been attended to by pointing and edging.

117. BUDDHIST STUPA, SANGHOL, DISTRICT LUDHIANA.—The exposed portion of the stupa has been restored in brick masonry in lime cement mortar and recess pointing. The work is in progress.

DELHI CIRCLE

Delhi

118. ADILABAD FORT, ADILABAD, DELHI.—The work of stabilizing and watertightening the damaged and disturbed masonry of the fortification wall was carried out.

119. ABDUR RAHIM KHAN-I-KHANAN'S TOMB, DELHI.—The damaged, decayed and pulverized terrace of the tomb was removed and relaid afresh and finally finished matching with the original. Besides, the cut sandstone drains running all along the periphery of terrace were also restored. The arched cells were also repaired wherever necessary.

120. CHAUSATH KHAMBA, DELHI.—Environmental improvement of the tomb in collaboration with INTACH was taken up and ashlar pathways and green lawn in between monument laid. The work is in progress.

121. HUMAYUN'S TOMB, DELHI.—Extensive structural repairs to the complex were taken up in a phased programme covering presently Bu-Halima's mosque, Isa Khan's tomb and main gate alongwith adjoining masonry enclosures. The work includes stabilizing, underpinning, partial restoration and watertightening of disturbed and damaged masonry side-by-side with the watertightening of terrace and floors. The work is in progress.

122. JANTAR MANTAR, DELHI.—In continuation of last year *(1985-86,* p. 170), the work of watertightening the paved pathways including fixing the new cut stones was continued and completed.

123. JAHAZ MAHAL, DELHI.—Extensive underpinning and fixing of missing red sandstone veneer over the facade of the main entrance and reproduction of ornamental niches, brackets and arches were executed. Repairs and reproduction of stucco mouldings in the interior walls and ceilings were also attended to matching the original. The work is in progress.

124. KOTLA FIRUZ SHAH, DELHI.—In continuation of last year's work *(1985-86,* p.169), the damaged, bulged and disturbed masonry of the gate including, western and southern enclosure walls were stabilized by way of underpinning and watertightening (pl.L) as per the original and the work is in progress.

125. QUTB MINAR, DELHI.—In continuation of last year's work *(1985-86,* p. 169), structural repairs to the Qutb Minar at ground floor were resumed and the crushed and damaged stone veneer was replaced (pl. LI). The work is in progress.

126. RAUSHANARA BARADARI, DELHI.—The ornamental troughs and fountains of the tank around the tomb were reconditioned and the decayed plain and moulded plaster of the exterior wall and brick pavement of the platform containing geometrical design in the rubbed bricks restored (pl. LII).

127. SABZ BURJ, DELHI.—In continuation of last year's work *(1985-86,* p. 170), the pulverized, missing and damaged coloured tiles of the dome of the octagonal tomb was carefully removed and reset and the dome surface watertightened with new tiles. Decayed plaster and damaged stucco mouldings in the interior faces were stabilized and inevitable restoration executed according to the available evidences matching with the original. The work is in progress.

GUWAHATI CIRCLE

Assam

128. CACHARI RUINS, KHASPUR, DISTRICT CACHAR.—Brick apron to Singh Darwaza and Ranachandi temple have been provided.

129. SHRI SURYA PAHAR RUINS, DASABHUJA DEVASTHAN, DISTRICT GOALPARA.—Cleaning of jungle, moss, lichen and cutting of wild trees have been done and approach road to the monument was widened.

130. SIBDOL, NEGHERITTING, DISTRICT JORHAT.—The decayed and missing plaster of the main temple and the sub-shrines has been removed and feplastered. Besides, vegetation clearance, trimming of trees, provision of doors to all sub-shrines including painting have also been done.

131. ROCK-CUT TEMPLE, MAIBANG, DISTRICT NORTH CACHAR HILLS.—Cleaning of moss, lichen and black patches from the monument including providing approach road have been undertaken.

132. TWO INSCRIBED STONES, MAIBANG, DISTRICT NORTH CACHAR HILLS.—The area around the monument has been fenced with barbed wire fencing.

133. RUINS OF FOUR MAIDUMS, CHARAIDEO, DISTRICT SIBSAGAR.—The work of fencing the area has been taken up and is in progress. The vegetational growths have been cleaned.

134. AHOM PALACE, GARHGAON, DISTRICT SIBSAGAR.—Underpinning, plastering, providing missing brickwork with special size bricks for cornice, parapet wall, terrace and flooring, grouting of cracks of ceilings and walls, repairs to stairs, providing brick apron on two sides and fixing of grill windows were taken up. The work is in progress.

135. ANCIENT TANK, GAURISAGAR, DISTRICT SIBSAGAR.—Deep rooted vegetation, herbs and shrubs and orther growth were completely uprooted and cleared.

136. VISHNUDOL, GAURISAGAR, DISTRICT SIBSAGAR.—The damaged top portion of the *sikhara* of the temple has been restored and plastering work is in progress.

137. DEVIDOL, JOYSAGAR, DISTRICT SIBSAGAR.—Jungle growth was removed and moss, lichen cleaned.

138. GHANASHYAM'S HOUSE, JOYSAGAR, DISTRICT SIBSAGAR.—Terracing of the top, providing missing brickwork, sealing of cracks and cement concrete support to the wall at the back, west and eastern sides of the monument were done.

139. GOLAGHAR, JOYSAGAR, DISTRICT SIBSAGAR.—The cracks developed on the roof of the monument on both sides were throughly grouted and terraced including of plastering the inner and the outer walls. The work is in progress. Cleaning of moss, lichen, black patches, patch repairing of floor and painting to the fencing and doors were also done.

140. KARONGHAR, JOYSAGAR, DISTRICT SIBSAGAR.—Terracing of the open air platform (partly at the entrance) was done including flooring of the cells below it and the work is in progress. Besides, cleaning of jungle, vegetration, moss, lichen etc., from the compound and the monument were also attended to.

141. RANGHAR PAVILION, JOYSAGAR, DISTRICT SIBSAGAR.—The flooring of the ground floor of the monument has been completely redone alongwith other works such as underpinning, plastering, restoration of ornamental pillars, designs, etc.

142. SIBDOL (BHOG GHAR), JOYSAGAR, DISTRICT SIBSAGAR.—The cracks developed on the roof and all around the walls were thoroughly grouted and stitched and the debris removed.

143. VISHNUDOL, JOYSAGAR, DISTRICT SIBSAGAR.—Damaged floor of the *mandapa* was repaired besides, cleaning of vegetation and fixing of doors in the main temple and the *mandapa.*

144. EIGHT CANNONS OF THE AHOM PERIOD, SIBSAGAR, DISTRICT SIBSAGAR.—Entire flooring was renewed and cannons cleaned.

145. SIBDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—The brickbuilt gateway at the rear side of the main temple which was badly tilted has been reconstructed.

146. MOUND AND RUINS OF THE STONE TEMPLE, DAH-PARBATIYA, TEZPUR, DISTRICT SONITPUR.—Cleaning of jungles and vegetation, trimming of trees, earth-filling, repairing and painting of fencing were done.

147. BORDOL TEMPLE, VISHWANATHGHAT, DISTRICT SONITPUR.—Damaged roof of the *mukha-mandapa* of the temple has been renewed with complete reterracing, removing the dead mortar and mending damages, grouting, pointing joints and stitching cracks, providing missing brickworks, plastering, etc., wherever necessary have also been done besides providing brick apron around the temple.

Manipur

148. TEMPLE OF VISHNU, BISHENPUR, DISTRICT BISHENPUR.—Jungle growth from the site and surroundings have been removed and brick pathway provided.

Meghalaya

149. STONE MEMORIAL OF U-MAWTHAWDUR BRIEW, NARTAING, DISTRICT JAYANTIYA HILLS.—Vegeta tion growth, lichen, etc., have been removed.

150. SCOTT'S MONUMENT, CHERRAPUNJI, DISTRICT KHASI HILLS.—The vegetational growth was removed and lichen, and black patches cleaned.

Nagaland

151. RUINS OF A FORT, DIMAPUR, DISTRICT KOIIIMA.—The works such as levelling of the site, making

earthen platforms for the monoliths and fixing the monolith in rows and petty repairing to the ancient gateway have been undertaken and the work is in progress.

Tripura

152. SCULPTURES AND ROCK-CUT RELIEF OF UNAKOTI TIRTHA, UNAKOTI HILLS, DISTRICT NORTH TRIPURA.—Vegetation growth has been removed and brick steps repaired.

153. BHUVANESVARI TEMPLE, UDAIPUR, DISTRICT SOUTH TRIPURA.—Flooring of the entire platform of the temple has been done alongwith other repairing works i.e. underpinning, pointing, plastering, etc. The area has been fenced with barbed wire.

154. GUNAVATI GROUP OF TEMPLES, UDAIPUR, DISTRICT SOUTH TRIPURA.—The conservation works such as flooring, patch-plastering, repairing to the dome were attended. Brick apron to all the three monuments was also provided.

155. TEMPLE OF CHATURDASADEVATA, UDAIPUR, DISTRICT SOUTH TRIPURA.—Two minarets of the *mukha-mandapa* have been reconstructed and vegetation growth cleaned and doors repaired.

HYDERABAD CIRCLE

Andhra Pradesh

156. FORT, CHANDRAGIRI, DISTRICT CHITTOOR.—The missing stone *chajjas* of the roof of the Sri Chennakesava Svami temple were replaced as per existing stone.

157. SAUMYANATHA TEMPLE, NANDALUR, DISTRICT CUDDAPAH.—One of the breaches of the southern wing of the *prakara* wall was reconstructed with new stones of same colour and texture. The core of the wall was filled with bricks in cement lime mortar.

158. SRI KODANDARAMASVAMI TEMPLE AND ADJOINING BUILDINGS, VONTIMITTA, DISTRICT CUDDAPAH.—The north face of the southern *gopura* was conserved. After removing the loose portions of the brick moulding, architectural details like pilasters, *kudus, panjaras* and *simha-lalata* motifs were restored with brick jelly in cement lime mortar. The decayed vaulted portion of fourth *tola* was also restored with specially prepared moulded bricks and finally treated with plaster.

159. BHIMESVARA TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.—The old plaster and lime wash over the *sikhara* of the main temple and sub-shrines were chemically removed and missing architectural mouldings over the *sikhara* restored. The worn-out plaster at the joint over the walls were removed and pointed as per original. The modern brick walls of the *navagraha* and *ashtadikpala mandapa* were removed and replaced with iron grills and painted with matching colours.

160. BHIMESVARAM TEMPLE, SAMALKOT-BHIMAVARAM, DISTRICT EAST GODAVARI.—The decayed old plaster and accumulated lime wash over the brick *sikhara* of the main temple were carefully removed. The missing mouldings of *sikhara* were restored in brick masonry after attending the patch plastering and finally applied with light yellow Snowcem colour. The damaged brick jelly flooring on the first floor of the main shrine was completely removed and relaid in the same fashion with the same type of material. The old lime plaster at the joints of the walls *of the garbha-griha* and *maha-mandapa* was also removed carefully and cleaned with chemicals and repointed in a recessed manner by adding suitable colour in combination mortar. The existing modern brick parapet walls on the eastern side of the steps of the main shrine was removed and provided with G.I. pipe railing.

161. EXCAVATED SITE, NAGARJUNAKONDA, DISTRICT GUNTUR.—Due to constant dashing of the flood waters over the structures several casing slabs of the steps of bathing *ghat* were dislocated. At many places the basement mortar is either disturbed or decayed. After removing the loose mortar of the basement, the surface was thoroughly cleaned and the disturbed casing Cuddapah slabs reset on firmly laid combination mortar bed. The joints were filled with liquid cement to make the bonding more effective.

162. GOLCONDA FORT, GOLCONDA, DISTRICT HYDERABAD.—The pointing work of the fort wall was attended to in front of military staff quarters in combination mortar. The black moss formed over lime plaster of the main gate of Balahissar was entirely cleaned with chemicals and finally treated with preservative. The damaged lime plaster on the northern side of the main gate was removed and replastered. To arrest the rain water percolation over the plastered surface of the main gate the holes in the battlemented portion on the top were plugged with suitable stone masonry. The accumulation of lime wash over the curtain walls in front of the main gate was removed and cleaned by using suitable chemicals. The earth inside the swinging rooms of Naginabagh was removed and fresh floor laid with cement concrete and joints of the wall repointed. The dressed cut stones were fixed inside the arches towards Naginabagh. The wide gaps on the northern side walls were filled with stone masonry.

163. ALAMPUR TEMPLES, ALAMPUR, DISTRICT MAHBUBNAGAR—In continuation of the last year's work *(1985-86,* p. 174), the transplantation of all the twenty -three Papanasi group of temples in original pattern, alignment and orientation has been completed.

The foundation for the reconstruction of Sangamesvaraswami temple in black cotton soil has been excavated. The raft foundation in reinforced cement concrete has been laid for uniform load bearing. The C.R. masonry footings have been filled-up with *murrum* and rubbles. The architectural cut stones and original plinth of the *garbha-griha* and the pillars of the *maha-mandapa* have been transported to the site.

164. RAMAPPA TEMPLE, PALAMPET, DISTRICT WARANGAL.—The loose plaster and decayed brick portions of the *sikhara* were removed and missing architectural mouldings restored. The decorative motifs of the *sikhara* were also restored. After removing the architectural members of the dilapidated

nandimandapa of the temple, the foundations were laid in cement concrete. The reconstruction work is in progress.

165. WARANGAL FORT, WARANGAL, DISTRICT WARANGAL.—In continuation of previous year's *(1985-86,* p. 174) work the underpinning of the sunken portions of the *linga-pitha* platform of Svayambhu temple complex has been done to arrest further sinking and to strengthen the foundations. After filling the floor-bed inside with rubble packing in sand and cement, the huge floor slabs were relaid.

JAIPUR CIRCLE

Rajasthan

166. NILKANTHA MAHADEVA TEMPLE, NEELAKANTH, DISTRICT ALWAR.—The existing uneven flooring of the courtyard of the temple was dismantled and reset with old and new stones and the joints pointed. The clearance of the ancient *baoli* is in progress.

167. FORT, BHARATPUR, DISTRICT BHARATPUR.—The repairs to the fortification wall were carried out by way of eradication of rank vegetation and jungle growth, pointing of the deep and wide masonry joints and underpinning of the voids and hollows. The work is in progress.

168. DIG PALACE, DIG, DISTRICT BHARATPUR.—The decayed plaster on the outside walls of the overhead tank was dismantled and replastered.

169. PALACE, BUNDI, DISTRICT BUNDI.—The damages to the floors and walls of the *Chitrasala* have been repaired. General clearance of the tank, side rooms and *chhatri* etc. has been done. Broken steel railing on the stairs leading to the *chitrasala* and the decayed wood work of the doors were repaired and painted. Approach road to the monument was cleared off debris and made functional.

170. MONUMENTS, BADOLI, DISTRICT CHITTAURGARH.—The work of fencing the protected area is in progress. The stone pitching on the slopes of the pavement on either side has been reset and pointed. The culvert has been repaired by replacing the broken stone slabs and laying fresh lime-cement concrete.

171. FORT, CHITTAURGARH, DISTRICT CHITTAURGARH..—Reconstruction of the fallen fortification well was continued. The broken stone lintels and slabs in *asvasala* in Rana Kumbha palace have been replaced by new ones and the terrace has been rendered watertight by laying fresh lime concrete as per original (pl. LIII).

172. FORT INCLUDING ANCIENT TEMPLES, JAISALMER, DISTRICT JAISALMER.—The work of resetting of cracked and bulged out bastion of the fort was continued. A portion of the lower fortification wall which gave way during the rains was completely dismantled and reconstructed as per original (pl. LIV).

173. PATWON-KI-HAVELI, JAISALMER, DISTRICT JAISALMER.—The decayed members of the roof were replaced with new ones as per original pattern. The hanging ceiling was lifted up and brought to original alignment.

174. Buddhist caves, Kolvi(Dag), District Jhalawar.—Fallen debris in side Caves 7 and 15 was cleared off and Caves 49 to 61 exposed by clearing the jungle.

175. FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.—The work of providing concealed steel girders in the broken stone beams and finishing the outer surface as per original in Hamir palace was continued (pl.LV). The collapsed roof of the central hall of the *Chhoti Kacheri* was restored.

MADRAS CIRCLE

Kerala

176. MATTANCHERRY PALACE, COCHIN, DISTRICT ERNAKULAM.—The rotten and decayed wooden members such as beams, planks, rafters, etc., of the ceiling were dismantled and replaced with new ones. The entire tiles over the roof of the palace were removed and reset with available old as well as new tiles. The entire wooden members over the roof and the ceiling of the northern wing of the ground floor were provided with coat of wood preservatives.

177. PALGHAT FORT, YAKKARADESAM, DISTRICT PALGHAT.—The accumulated debris and earth in the north-west corner was cleared. The moat around the fort wall was cleared off from water weeds and the work of raking out the old pointing of the granite masonry wall of the fort was completed and flush pointing the same in combination mortar is in progress. Underpinning the brick portion of the fort wall after removing the damaged portion is in progress.

178. SIVA TEMPLE, PERUVANAM, DISTRICT TRICHUR.—The accumulated earth in between the *kuttambalam* and *vilakkumadam* was removed and levelled. The old lime plaster from the inner face of the *vilakkumadam* was raked out and replastered with combination mortar.

179. FORT, ANJENGO, DISTRICT TRIVANDRUM.—The work of removing the rank vegetation and painting the doors of the fort was completed.

180. TEMPLES OF PARASURAMA, BRAHMA, SIVA AND MATSYA, TIRUVALLAM, DISTRICT TRIVANDRUM — In order to arrest the earth filling into tank during rainy season, a rubble masonry wall was constructed over the existing wall. The joints in the stone masonry wall were pointed in cement mortar. [l]*GV* pipe railing with T' and four way joints were provided over the tank wall.

Pondicherry

181. PANCHANADISVARA TEMPLE, TIRUVANDARKOVIL, PONDICHERRY.—The bulged and out-of-plumb

stone wall around the *maha-mandapa* was completely dismantled and reconstructed as per the original after strengthening the foundation.

Tamil Nadu

182. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—The leaky terrace of the *mukha-mandapa* and the front pillared *mandapa* were watertightened with fresh brick jelly concrete and flat tiles, after removing the old decayed and weathered course. The damaged stone flooring inside the *mandapa* and the outer *prakara* were relaid with old and new stones wherever necessary.

183. DHARMESVARA TEMPLE, MANIMANGALAM, DISTRICT CHINGLEPUT.—The leaky roof over the *mandapa* has been watertightened after replacing the missing ceiling slabs. The mud floor in the *mandapa* and the front porch have been paved with new stones. The damaged brick coping over the *thirumadil* and the enclosure wall of the Amman shrine were repaired and replastered. In order to prevent scouring of earth, a brick wall was constructed on the western side. The monument was provided with a grill gate to the inner *prakara,* a cultural notice board, protection notice board and a direction board.

184. KANTHALINGESVARA TEMPLE, TENNERI, DISTRICT CHINGLEPUT.—The accumulated earth within the temple enclosure was removed and levelled. The eastern ramp alround the temple was provided with stone pitching and the joints. The south-western comer of the *garbha-griha* which had gone out-of-plumb was completely dismantled and re-constructed after providing suitable foundation. The monument was provided with a cultural notice board.

185. NITYAKALYANASVAMI TEMPLE, TIRUVIDANTHAI, DISTRICT CHINGLEPUT.—The Out-of-plumb *thirumadil {prakara* wall) all around the temple was dismantled and reconstructed after providing a suitable foundation. The leaky terrace over the sixteen-pillared *mandapa, vahana-mandapa, madapalli* (kitchen), *adhyapaka-mandapa* and first and the second *gopuras* were watertightened. The accumulated earth around the temple was excavated and levelled. The whitewash over the walls and pillars were removed. The cracked ceiling slabs and pillars inside the *Ranganatha mandapa* was replaced with new ones. The work of relaying the ceiling slabs is in progress.

186. VAIKUNTHAPERUMAL TEMPLE, UTTIRAMERUR, DISTRICT CHINGLEPUT.—To avoid seepage of water into the foundation, stone apron was provided all around. The leaky terrace of the *vahana-mandapa* was watertightened. The damaged plaster over the exterior wall was removed and replastered.

187. TIRUPULISVARA TEMPLE, VAYALUR, DISTRICT CHINGLEPUT.—The architectural members scat tered all over within the complex were collected and stacked. The accumulated earth and debris covering the basement of structures in the complex was removed by means of scientific clearance and the moulded *adhisthana* portions were exposed. Structure 2 was completely dismantled and recon structed after providing suitable foundation.

188. ROCK-OUT CAVE TEMPLES, TIRUNANDIKARA, DISTRICT KANYAKUMARI.—A retaining wall in rubble masonry was constructed in order to check erosion of earth due to storm water. The wooden framed mesh was provided with two coats of enamel paint.

189. VATTAKOTTAI FORT, VATTAKOTTAI, DISTRICT KANYAKUMARI.—The existing well inside the fort was repaired by underpinning and plastering. The joints in the fort wall were pointed in cement mortar.

190. FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—The damaged false ceiling in the third floor of Clive Building has been repaired. The tiled floor in the hall of the ground floor has been replaced. The salt-affected plaster has been raked out and replastered. The damaged ridge piece in the ceiling of the third floor has been replaced and the leakage in the A.C. sheet roof has been arrested.

The fallen rampart on the northern side of the fort has been reconstructed to match with the original and the fort wall has been cleared off the vegetation growth.

191. SOMANATHA TEMPLE, MELPADI, DISTRICT NORTH ARCOT—The bulged out wall of the *mukha-mandapa* and the dilapidated southern cloistered *mandapa* were completely dismantled. After providing suitable foundation, they were reconstructed by using the available materials and replacing the broken members with new ones.

192. FORT, VELLORE, DISTRICT NORTH ARCOT.—In order to prevent encroachment and misuse of the area, grill fencing for the protected area on the eastern side of the fort glacis was provided. A coursed and roughly dressed stone masonry of 0-75 m height was constructed over stone jelly concrete foundation of 20 cm thickness over which the grills were fixed. Two grilled gates, one each on the eastern and northern sides, were provided.

193. JALAKANTESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT.—The *kalyanamandapa* which had a series of broken beams and sunken flooring, was completely dismantled after proper documen tation and the same has been reconstructed up to the capital level after providing a firm foundation of stone jelly concrete rubble stone footing. The work of erecting beams is in progress. The accumulated earth all around the temple was removed to a width of 3 m from the *prakara* wall and slopes pitched with stones and necessary pointing done at the joints in order to check soil erosion. The accumulated earth in the inner and *outer prakaras* was removed to reach the original working level. During the course of the work, the original drain outlets were traced and reactivated. The work of paving the stones for the inner *prakara* over a bed of stone jelly concrete is nearing completion. The decayed and rotten wooden door of the northern entrance was replaced with new teak wood.

194. JAINA TEMPLE, METTUPUDUR, VIJAYMANGALAM, DISTRICT PERIYAR.—The damaged plaster over the compound wall was removed and replastered in combination mortar and suitably toned to match with the original.

195. SIKHANATHASVAMI TEMPLE, KUDIMIYAMALAI, DISTRICT PUDUKKOTTAI.—The terrace Of the hundred pillared *mandapa* was watertightened after replacing the missing and borken beams and slabs

with new ones. The *kalyanamandapa* was dismantled and reconstructed up to the basement level after providing a suitable foundation and the work of erecting pillars and capitals is in progress.

196. RAJENDRACHOLESVARA TEMPLE, PONNAMARAVATHY, DISTRICT PUDUKKOTTAI.—The withered terrace of the sanctum of Amman and sub-shrines and that of cloistered *mandapa* on the south, east and west sides were dismantled and watertightened. Damaged leaky *vimanas* were also watertightened. Flooring inside the cloister *mandapas* has been finished with brick jelly concrete and finally plastered (pl. LVI). The stone joints on the walls of the *garbhagraha,* Amman shrine and cloistered *mandapa* were pointed afresh after removing the decayed mortar. The stone flooring inside the main shrine and Amman shrine were removed and reset.

197. FORT WITH BUILDINGS, ATTUR, DISTRICT SALEM.—The exterior surface of the brick wall on the south, north and west sides of the Kalyana Mahal was replastered in combination mortar. The brick basement of the Kalyana Mahal was filletted and the joints flush pointed with cement mortar. The exterior walls of Granary-I were replastered and suitably toned to match with the original. The leaky surface of Granary-II was watertightened by laying two layers- of flat tiles and plastered with combination mortar. The dilapidated bastion to the fort on the south side was dismantled and the reconstruction of the same is in progress.

198. FORT AND TEMPLES, CHINNAKAVANDANUR, DISTRICT SALEM.—The Veerabhadra shrine with its sunken foundation, out-of-plumb walls and leaky terrace were dismantled and reconstructed after providing a suitable foundation. The damaged wooden false ceiling was replaced with new teak wood members. The *dislodged prakara* wall was also dismantled and reconstructed with available stones. The *mandapa* was provided with a new stone flooring and finally pointed.

199. FORT, NAMAKKAL, DISTRICT SALEM.—The main entrance was provided with an iron grill door and the retaining wall restored as per original.

200. RANGANATHASVAMI TEMPLE, NAMAKKAL, DISTRICT SALEM.—The buried ornamental features over the plinth of the Amman shrine were exposed by excavating the accumulated debris. The dislodged stone masonry wall of the tank was dismantled and reconstructed in combination mortar. The sunken flight of steps to the main temple was removed and reset.

201. FORT, GINGEE, DISTRICT SOUTH ARCOT.—The out-of-plumb stone wall on either side of the main entrance including the support buttress wall and the brick parapet of the fort have been dismantled and reconstructed upto the ground level after providing concrete foundation and rubble masonry-footing.

202. VENKATARAMANA TEMPLE, GINGEE, DISTRICT SOUTH ARCOT.—The broken and dislodged roof slabs and beams on the northern and southern sides of the *sabha-mandapa* (pillared hall) and the sub-shrine in the north-east corner were dismantled and reconstructed. A portion *of sabha-mandapa* (north

side) has been watertightened. The tank inside the temple complex which was damaged has been dismantled and reset after providing a firm foundation and provided with a brick parapet and coping. The *vimanas* over the sub-shrines were repaired and rendered watertight.

203. PATTABHIRAMA TEMPLE, NARASINGARAYANAPETTAI, DISTRICT SOUTH ARCOT.—The out-of-plumb walls and the leaky terrace of the *mandapa* and *ardha-mandapa* have been dismantled and recon structed upto basement level after providing a firm foundation.

204. AIRAVATESVARA TEMPLE, DARASURAM, DISTRICT THANJAVUR.—The terrace over the eastern and portion of southern *mandapa* was watertightened and provided with new stone flooring. The cloistered *mandapa* including the *thirumadil* on the south-western side and the sub-shrines altogether six, inside the western cloistered *mandapa* were dismantled and reconstructed upto the ceiling level (pl. LVII). The lower *mandapa* was also dismantled upto basement level.

205. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—The damaged drain along the western corridor was dismantled and reconstructed. The work of dismantling the badly damaged brick flooring in the open courtyard all around the main temple was completed.

206. SIVA TEMPLE, VALIKANTAPURAM, DISTRICT TIRUCHIRAPPALLI.—The terrace over the Amman shrine was watertightened and old stone flooring on the north side of the main shrine was reset. The work of providing new stone flooring on the southern and northern sides and to *madapalli* (kitchen) is in progress.

207. BHAKTAVATSALA TEMPLE, SARMADEVI, DISTRICT TIRUNELVELI.—The accretionary lime wash over the walls, pillars, beams and capitals containing inscriptions and sculptured panels was removed, and original features exposed. The wooden door and welded mesh were provided with two fresh coats of enamel paint. The work of spreading the gravel over the pathway was completed.

208. ROCK-CUT CAVE, TIRUMALAPURAM, DISTRICT TIRUNELVELI.—The work of deepening the existing groove in the rock above the cave on the exterior to drain out rain water and painting the wooden framed welded mesh with two coats of enamel paint was completed.

209. VALISVARA TEMPLE, TIRUVALISVARAM, DISTRICT TIRUNELVELI:—The accretionary lime wash over the wall surfaces, pillars, ceiling etc., were removed by using mild chemicals in order to expose the original features and inscriptions. The temple doors were painted with two coats of grey enamel paint after scraping the old painting.

MINI CIRCLE, GOA

Goa

210. SAFA MASJID WITH MASONRY TANK, BANDORA, GOA.—The work of reconstruction of the fallen arches has been taken up and completed in combination mortar with salvaged laterite stones.

211. CHURCH OF LADY ROSARY, BANQUERIM, GOA.—G.I. rain water channels were provided on the edge of the tiled roof.

212. MAHADEVA TEMPLE, CURDI, GOA.—The ancient platform to the south of main temple was carefully dismantled stone by stone and shifted to the new site after proper documentation. The bed concrete for foundation was laid for main temple at new site and the laterite stone masonry in combination mortar was raised up to ground level.

213. AGUADA FORT, GOA.—The work of restoration of breached portion of the fort wall with laterite stone masonry in combination mortar located midway of the approach leading to Taj Hotel is in progress.

214. BASILICA OF BOM JESUS, VELHA GOA, GOA.—A part of enclosure wall was restored in laterite stone masonry in combination mortar. The work is in progress.

215. SE CATHEDRAL, VELHA GOA, GOA.—The spongy plaster of the drains of side terraces was scraped off and replastered with combination mortar and the surface of drains rendered watertight. Wood preservatives were also applied to the wooden king-posts of the roof.

216. CHURCH AND CONVENT OF ST. FRANCIS OF ASSISI, VELHA GOA, GOA.—The work such as removal of entire Mangalore tiles of the roof, replacement of decayed battens with new ones wherever felt necessary, applying wood preservatives to the wooden members of the roof, laying of brick jelly concrete in combination mortar over the vaulted roof and plastering after removal of decayed concrete and filling the cracks, providing G.I. sheet over the rafters with specially galvanized nails, refixing and relaying wooden battens and Mangalore tiles respectively has been taken up and completed G.I. Rain water channels were provided on the edge of the tiled roof.

217. CHAPEL OF ST. CAJATAN, VELHA GOA, GOA.—The entire Mangalore tiles of the roof were removed and relaid by replacing the decayed ones after applying wood preservative. The pulverized plaster of the wall by the side of the passage to the convent was scooped out and replastered with combination mortar. The rotten members and broken glass panes were replaced with new ones.

MINI CIRCLE, SHIMLA

Himachal Pradesh

218. SHRI LAKSHMI-NARAYANA GROUP OF TEMPLES, CHAMBA, DISTRICT CHAMBA.—In continuation of previous year's work *(1985-86,* p. 168), the decayed wooden members of the *chhatris* and canopies of the Lakshmi-Narayana and Chandragupta temples were dismantled and replaced with new ones and missing slate stones were also replaced by new ones.

219. HIDIMBA DEVI TEMPLE, MANALI, DISTRICT KULLU.—The old and decayed wooden members of the roof of the first tier of the temple have been replaced with new ones. The work of relaying the sunken and dislodged stone slab flooring of the compound, resetting of the stone steps and reconstruction of retaining wall has been completed.

220. ARDHANARISVARA TEMPLE, MANDI, DISTRICT MANDI.—The out-of-plumb southern wall of the *mandapa* has been dismantled and reset as per original (pl. LVI1I-LIX).

221. TRILOKINATH TEMPLE, MANDI, DISTRICT MANDI.—In continuation of last year's work (*1985-86,* p. 168), the reconstruction of the retaining wall of the temple has been taken up and completed (pl. LX). The debris accumulated near the temple on north side has been removed and remains of miniature shrines exposed.

PATNA CIRCLE

Bihar

222. ANCIENT SITE OF VIKRAMASILA MONASTERY, ANTICHAK, DISTRICT BHAGALPUR.—In continuation of the last year's *(1985-86,* p. 181) work, the manufacturing of special size bricks was completed and repairing the flight of steps in stone masonry leading to the temple and underpinning, pointing and repairing of the floor has been carried out.

223. EXCAVATED REMAINS, LAKHISARAI, DISTRICT MONGHYR.—Resetting, watertightening and underpinning of the structural remains were carried out. The raised pathway with hand railing from the north facade was also provided.

224. EXCAVATED REMAINS, NALANDA, DISTRICT NALANDA.—Resetting, watertightening and un derpinning of the structural remains and providing brick-on-edge pathway laid on lime-concrete base was carried out.

225. TOMB OF HASAN SHAH SUR, SASARAM, DISTRICT ROHTAS.—The M.S. Grill around Hasan Shah Sur's tomb was provided.

226. TOMB OF SHER SHAH, SASARAM, DISTRICT ROHTAS.—The work of fixing of veneer stone of the ceiling of the dome and providing of the M.S. grills around the tank and desilting of outlet channel within the protected area was carried out.

Uttar Pradesh

227. BUDDHIST REMAINS, KASIA, DISTRICT DEORIA.—Brick-on-edge pathway over lime-concrete base was provided around Ramabhar Stupa.

228. CHARUNGLI MOSQUE, JAUNPUR, DISTRICT JAUNPUR.—In continuation of the last year's *{1985-86,* p. 181) the work of providing iron grill to prevent trespass of visitors was completed.

229. DHAMEKH STUPA, SARNATH, DISTRICT VARANASI.—The work of resetting, underpinning and watertightening of the structural remains with special size bricks was completed.

SRINAGAR CIRCLE

Jammu and Kashmir

230. SUN TEMPLE, MARTAND, DISTRICT ANANTNAG.—The miniature shrines within the temple complex which were in dislodged condition were repaired. The pathway from the road to the temple was made all weather proof by providing stone pavings.

231. MUGHAL BUILDING AROUND THE SPRING, VERINAG, DISTRICT ANANTNAG.—The Mughal arcade had weathered badly due to heavy rain and snowfall and its upper fabric (brick and stone masonry) had become very weak and had started disintegrating resulting in leakage, accumulation of debris and dislodging. The inner-core of various parts of the complex strengthened and the rear side of the arcade was repaired in random rubble masonry and top lime concreted as per the original. Besides, the flanking arched sides of the main vault were also repaired in random rubble masonry as per the original. The *chhajja* stones were also fixed on the projected brackets of the inner arcade. The work is in progress.

232. REMAINS OF STUPA, PARIHASPURA, DISTRICT BARAMULA.—The accumulated debris from the front entrance of ruinous stupa was removed and restoration of core of steps leading to the stupa terrace was partially completed. The work is in progress.

233. SANKARA-GAURISVARA TEMPLE, PATTAN, DISTRICT BARAMULA.—To prevent the erosion of soil around the temple, a retaining wall was constructed all along the fenced area.

234. PRATAPASVAMI TEMPLE, TAPAR, DISTRICT BARAMULA.—Repairs to the miniature shrine which was in a highly disjointed condition was taken up and the rear wall and sanctum flooring completed.

235. STUPA AT TISSERU, DISTRICT LEH.—The fallen debris of the stupa on the eastern side was removed and damaged circular bases repaired as per original. Further work is in progress.

236. AVANTISVAMI TEMPLE, AVANTIPUR, DISTRICT PULWAMA.—The repairs to the main shrine by way of fixing the dislodged stone on the northern side was carried out. A drain connecting the old drain was also provided to divert the flow of rain water.

237. AVANTISVARA TEMPLE, AVANTIPUR, DISTRICT PULWAMA.—The main temple which is in a highly dilapidated condition was taken up for repairs. The debris from the eastern side was removed and the missing steps provided as per the original. Besides, repairs to the main entrance flooring and inner and

outer steps were carried out. To make the temple approachable throughout the season, a stone paved pathway was also provided.

238. SANKARACHARYA TEMPLE, DURGANAG, DISTRICT SRINAGAR.—The octagonal parapet wall which was built sometime in the past in modern bricks was taken up for repairs in stone masonry. The work is in progress.

239. MOSQUE OF AKHUN-MULLA SHAH, HARI PARVAT, DISTRICT SRINAGAR.—To prevent the misuse of the isolated mosque by miscreants the wooden doors were provided to all the openings.

240. PANDRETHAN TEMPLE, PANDRETHAN, DISTRICT SRINAGAR.—A long drain which fetches the river Jhelum water to the temple pond was taken up for repairs. After removing huge quantity of accumulated debris, the missing portions of the drain walls were built in random masonry. Besides, repairs to the main outlet of the temple pond was also carried out and a causeway prepared.

241. KATHI-DARWAZA, SRINAGAR, DISTRICT SRINAGAR.—The fallen right side bastion of the main entrance was repaired in random rubble masonry and the base was encased with fine chisel dressed stone with mouldings as per the original. To make the top of the main gateway watertight the dead lime concrete was removed and a layer of fresh lime concrete provided as per the original.

242. MONUMENTS KNOWN AS PARI MAHAL, SRINAGAR, DISTRICT SRINAGAR.—The terraced garden built by the Mughal prince Dara-Shikoh was taken up for repairs. The parapet wall of Terrace 1,2 and 3 was built in random rubble masonry with *chhajjas* in slate stone as per the original. The top of the *baradari,* built on Terrace 3 was lime concreted. Besides, repairs to the tank built on terrace 2 was also carried out.

243. SIX ANCIENT TEMPLES, WANGATH (NARANAG), DISTRICT SRINAGAR.—The main temple in the second group of temple which was in a highly dilapidated condition was taken up for structural repairs. The dislodged parts of the wall were taken down and accumulated debris removed. After removing the debris the foundation of the temple was strengthened and the entire basement was repaired as per the original. After repairing the basement the dislodged parts were reset. The work is in progress.

244. GROUP OF TEMPLES, BABORE, DISTRICT UDHAMPUR.—In continuation of previous year's work, the exterior niches which were completely weathered and disjointed were taken down carefully and restored as per the original. While restoring the pillars the mouldings and fluting as per the original were also manufactured and fixed.

245. GROUP OF FOUR TEMPLES, KIRAMCHI, DISTRICT UDHAMPUR.—The disjointed portion of *sikhara* of the. Temple 5 was taken down carefully piece by piece and reconstructed as per the original. Besides, the veneer work *of sikhara* which had also fallen down was also restored as per the original. The work is in progress.

246. OLD PALACE, RAMNAGAR, DISTRICT UDHAMPUR.—Huge amount of the accumulated debris which had covered the major portion of the courtyard of the palace was taken up for repairs. A substantial amount of the debris has been removed and the structures lying buried have been exposed and the work is in progress. Repairs to the fort wall were also taken up and is in progress.

247. PALACE OF RAJA SUCHET SINGH, RAMNAGAR, DISTRICT UDHAMPUR.—Due to ravages of time and human vandalism, the Diwan-i-Am complex of the palace suffered heavily. To save the monument from further decay, its damaged wall, arched openings, parapet walls and the roof which had become unsafe due to rotting of the wood and loosening of the masonry, were taken down and repaired as per the original. To make the roof of the main hall impervious and to sustain dead load, R.S. joist beam was provided in concealed manner across the central pillar for the safety of the roof. The work is in progress.

248. SAMADHI OF QUEEN OF RAJA SUCHET SINGH, DISTRICT UDHAMPUR.—The rotten wood of the roof of the rooms in Samadhi complex was taken down and repaired with the new one as per the original. Besides, the fallen compound wall was also repaired.

VADODARA CIRCLE

Daman and Diu

249. FORT WALLS, MOTI DAMAN, DISTRICT DAMAN.—In continuation of last year's *(1985-86,* p. 184) work, the worn-out and sunken ashlar stone masonry has been replaced and reconstructed with new stones. The dead lime concrete has been replaced with fresh layer of new lime concrete. The out-of-plumb rubble brick masonry has been dismantled and reconstructed. The growth of vegetation has been removed. The walls have been made watertight. The low lying areas have been filled up with earth to avoid water stagnation. The work is in progress.

250. FORT, DIU, DISTRICT DIU.—The repairs of the missing portions of fort wall in black stone is in progress.

Gujarat

251. BABA LAULI'S MASJID, AHMEDABAD, DISTRICT AHMEDABAD.—In continuation of last year's work *(1985-86,* p. 184), the remaining work of providing *mihrab* to the missing portion in semi-marble stone has been completed with its original intricate carvings, mouldings and pattern set in white cement.

252. JAMI MASJID, AHMEDABAD, DISTRICT AHMEDABAD.—In continuation of last year's work *(1985-86,* p. 184), the remaining worn-out and cracked architectural members, pillars and brackets have been replaced with new stones.

253. KHANPUR GATE, AHMEDABAD, DISTRICT AHMEDABAD.—The bulged and out-of-plumb south west portion of the gate was dismantled. It has been reconstructed with its ashlar stone masonry and

hearting brick masonry. The worn-out stones have been replaced with new stones. From the northern wall, a huge pipal tree has been removed with its roots and the wall has been constructed. The roof has been made watertight after removal of dead concrete and laying of fresh concrete.

254. MOSQUE OF BAHLOL KHAN GHAZI, DHOLKA, DISTRICT AHMEDABAD.—The, bulged and out-of-plumb ashlar stone masonry of western wall has been completely dismantled and reconstructed. The dead hearting masonry was also removed and replaced with new ones. The broken brackets have been replaced with new ones as per original pattern of dressing and moulding. A *chhatri* which had fallen down in a cyclone has been reconstructed using original and new stones.

255. ANCIENT SITE, LOTHAL, DISTRICT AHMEDABAD.—The sunken bricks of warehouse have been replaced. The structures have been given a mud colourwash to give appearance of mud brick structures. A hidden cement pipe line has been laid to drain off rain water from the site. The saline water from the dockyard has been bailed out and the desilting of the dockyard is in progress.

256. TOMB OF AHMED KHATTU GANJ BAKSH, SARKHEJ, AHMEDABAD, DISTRICT AHMEDABAD.—In continuation of last year's work *(1985-86,* p. 184), the missing *kanguras* have been provided as per original. The broken stone *chhajja* has been replaced with new ones as per original. The marble and sandstone broken *jalis* have been replaced with new *jalis.* The lightening arrester has been repaired. The dome and roof has been made watertight.

257. JAMI MASJID, BHARUCH, DISTRICT BHARUCH.—In continuation of last year's work *(1985-86,* p. 185), the missing stone *jalis* have been restored. The damaged stone *chhajja* has been removed and replaced with new ones as per original dressing and mouldings. The old and badly damaged stone flooring has been replaced with new flooring on cement concrete bed. The work is in progress.

258. DVARKADHISH GROUP OF TEMPLES, DWARKA, DISTRICT JAMNAGAR.—In continuation of last year's *(1985-86,* p. 185) work, temporary rubble masonry support to the lintels of the *mandapa* on all the five storeys was provided.

259. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.—The broken pieces of *chhajja* of the *nritya mandapa* have been removed and new stone *chhajja* with original dressings and mouldings has been provided and fixed with copper bars, rose wood and mortar (pl. LXI). The missing ashlar stone masonry on the north-west corner and northern side *of the garbha-griha* has been restored with original dressing. The work is in progress.

In continuation of last year's work *(1985-86,* p. 185), saline water in the *kunda* has been bailed out and desilting done. The work is in progress.

260. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.—The work of desilting of the main shaft and the *Vav* is still in progress. The tilted, bulged and damaged portions of the side walls have been dismantled and reconstructed. The work is in progress.

261. SHAIKH FARID DARGAH AND RAUZA, PATAN, DISTRICT MAHESANA.—The work of construction of brick masonry retaining wall is in progress.

262. CITADEL WALLS, PAVAGADH, DISTRICT PANCHMAHALS.—In continuation of last year's work *(1985-86,* p. 185), the portions of wall and bastions which had bulged and gone out-of-plumb were dismantled and reconstructed as per original pattern.

263. JAMI MASJID, PAVAGADH, DISTRICT PANCHMAHALS.—The damaged ashlar stone masonry of the dome has been dismantled and new ashlar stone masonry has been constructed. The broken pieces of *chhajja* were removed and new *chhajja* provided as per original pattern.

264. KAMANI MASJID, PAVAGADH, DISTRICT PANCHMAHALS.—The dead concrete was removed and fresh concrete laid. The work is in progress.

265. KEVDA MASJID, PAVAGADH, DISTRICT PANCHMAHALS.—In continuation of last year's work *(1985-86,* p. 185), the barbed wire fencing has been provided around the mosque.

266. NAGINA MASJID, PAVAGADH, DISTRICT PANCHMAHALS.—In continuation of last year's work *(1985-86,* p. 186), the barbed wire fencing has been provided around the mosque to ward off any encroachment and to facilitate horticultural work. The area of the mosque has been cleared-off of vegetation, etc.

267. GROW OF TEMPLES, KHED AND RODA (RAISINGHPUR), DISTRICT SABARKANTHA .—In continuation of last year's work *(1985-86,* p. 186) the missing ashlar stone masonry has been provided. The missing flooring has also been reset. The *sikhara* has been watertightened.

268.'OLD ENGLISH AND DUTCH TOMBS, SURAT, DISTRICT SURAT.—In continuation of last year's work *(1985-86,* p. 186), the dead lime plaster has been removed from the walls, pillars, domes and arches and replastered in fresh lime cement mortar. Floral designs and motifs have been reconstructed as per original pattern and colour (pl. LXII). The dead lime concrete has been replaced with fresh lime concrete. The cracks have been thoroughly washed, grouted and made watertight. The work is in progress.

269. NANDODI GATE AND ADJACENT CONSTRUCTION, DABHOI, DISTRICT VADODARA.—A brick masonry compound wall with an iron grill over it has been provided to ward off the misuse of the area.

270. ANCIENT SITE, GORAJ, DISTRICT VADODARA.—The damaged and sunken brick masonry platform has been dismantled and reconstructed as per original.

MONUMENTS MAINTAINED BY THE STATES

ANDHRA PRADESH

The following monuments were conserved by the Department of Archaeology and Museums, Andhra Pradesh: Fort, Utnoor, District Adilabad; Gagan Mahal, Penugonda, District Anantapur, Saidamina tomb, Hyderabad, District Hyderabad; Fort, Kondapalli, District Krishna; Ammavari temple in the Panchalasomesvaraswami temple complex, Pangal, District Nalgonda; Ditchapalli temple, District Nizamabad; Appikonda temple, District Vishakhapatnam; and excavated stupa, Bavikonda, District Vishakhapatnam.

ASSAM

Conservation works have been carried out at the following monuments by the Department of Archaeology, Assam: Maidams (Burial Mounds) Charaideo, District Sibsagar, Fakuwa Dol at the old city of Rongpur, District Sibsagar; temple, Nazirakhat, District Kamprup; Brick temple, Na-Nath, District Nagaon; Brick temple, Hatimur, District Nagaon; Begor Dol, District Dibrugarh; and Gallow-site of martyr Piyali Phukan and Vishnu Dol, Barpatra, District Sibsagar.

MADHYA PRADESH

The Department of Archaeology and Museums, Madhya Pradesh carried out following conservation works:

1. ISLAMNAGAR PALACES, DISTRICT BHOPAL.—The roof of Rani Mahal was replaced with new R.C.C. work and gates provided and floor of the galleries concreted.

2. RAJWADA PALACES, INDORE, DISTRICT INDORE.—The walls and roofs of the palace were restored after bringing down the damaged stones.

3. ROYAL PALACE, VIJAYARAGHOGARH, DISTRICT JABALPUR.—The debris was cleared and new outlet for draining out rain water was provided.

4. CHHATRI, BHANPURA, DISTRICT MANDSAUR.—Frill work was introduced in the corridors of the *chhatri* for proper security of images.

5. FORT, HINGLAJGARH, DISTRICT MANDSAUR.—The Suraj Kund at the fort was desilted and masonry work reconditioned. Debris of Gauri site was cleaned and the traces of medieval temples exposed.

6. SURYA TEMPLE, KOHLA, DISTRICT MANDSAUR.—The plinth basement and roof of the temple was restored. The area has been fenced and a gate provided.

7. BUDDHIST VIHARAS, SIRPUR, DISTRICT RAIPUR.—The Buddhist viharas at Sirpur exposed to open air were provided with stone pavement after redressing the existing stone flooring. The monument was provided with barbed wire fencing.

8. SIVA TEMPLE, BILPANK, DISTRICT RATLAM.—The temple premises were provided with stone pavement and barbed wire fencing and fallen plinth walls restored.

9. SIVA TEMPLE, CHROPURA, DISTRICT SHIVPURI.—The basement of the temple was restored.

10. ANCIENT PALACE AT ORCHHA, DISTRICT TIKAMGARH.—The fresco paintings of Mughal and local schools of art in the Rani Mahal, Raja Mahal, Jahangir Palace and Praveen Mahal were chemically treated and preserved.

11. SIVA TEMPLE, BADNAGAR, DISTRICT UJJAIN.—The damaged stone lintel of doorway was provided with support iron pillar. The plinth of platform was restored and the loose sculptures were provided with masonry pedestals.

MANIPUR

The following monuments were conserved by the Manipur State during the period under review: temples of Sri Govindajee, Brinamchandra, Kangla, District Imphal; temple of Thangal General, Wangkhei, District Imphal ; temple of Leimapokpo Keirungba, M.S. R.T.C. compound, District Imphal; Samadhi of Maharaja Gambhir Singh, Lonkthabal, District Imphal; Samadhi of Maharaja Khaba, Uripok, District Imphal; and Gateway, Longthabal, District Imphal.

NAGALAND

Conservation works have been carried out at the following monuments by the Government of Nagaland: wooden sculptures, Shangju, District Mon; Second World War tank, Kohima town; stone monuments, Phulbari, Kohima Town; historical sites, Chungliyimti, District Tuensang; Jine and Ediben Memorial, Mongchen, District Mokokchung; and Sopfunuo Memorial, Rukhroma, District Kohima.

RAJASTHAN

The work of clearance and conservation was carried out at the following monuments by the Department of Archaeology and Museums, Government of Rajasthan: Akbar's Fort, Ajmer, District Ajmer ; Gumbad, Fateh Jung, Alwar, District Alwar; Fort, Dig, District Bharatpur; Sunga pillar, Awanleshwar, District Chittaurgarh; Talab Shahi, Dholpur, District Dholpur; Patwa Havelies, Jaisalmer, District Jaisalmer ; Amber palace, Amber, District Jaipur, Hawa Mahal, Jaipur; District Jaipur, Jantar Mantar, Jaipur, District Jaipur, Maharani's *chhatris,* Jaipur, District Jaipur; Nahargarh,

Jaipur, District Jaipur; Cenotaph, Punch Kunda, District Jodhpur, Sun temple, Budhadeet, District Kota; Sun temple, Varman, District Sirohi; Vishnu temple, Iswal, District Udaipur; Mira temple, Udaipour, District Udaipur, and Gangodbheda Kund, Udaipur, District Udaipur.

WEST BENGAL

The Department of Archaeology, Government of West Bengal, carried out the following conservation works:

1. BANESVAR TEMPLE, BANESVAR, DISTRICT COOCHBEHAR.—The roof of the temple has been made watertight and fissures and cracks developed on the ceiling and walls were repaired. The floor of the *natamandapa* has been renovated and the damaged plinth on the pond side repaired.

2. TEMPLE OF GANGES VAR A-SIVA, BARANAGA, DISTRICT MURSHIDABAD.—Conservation work has been taken up and the terracotta adorning the facade of the temple cleaned and preserved.

X. EXPEDITIONS OUTSIDE INDIA

INVESTIGATIONS OF PRE-ISLAMIC REMAINS IN MALDIVES

Under the SAARC technical assistance programme, B.P. Bopardikar, assisted by S.S. Gupta, Prehistory Branch and C.B. Patil of the Directorate of the Survey along with M.I. Loutfi, Director, National Centre of Linguistic and Historical Research, Male, carried out investigation of the pre-Islamic remains in the Maldives.

Among the pre-Islamic remains only Buddhist structures were noticed under coral stones in different atolls. A survey of the structures had been carried out earlier by M.I. Loutfi. The present work was restricted to excavation/clearance of debris of some of the Buddhist remains. Small-scale excavations were carried out in the islands of Ariadu, Kudahuvadu and Kurumathi in middle Maldives. Besides, Buddhist remains of Toddu and North Nilandu were also inspected.

Ariadu island is located to the south-west of Male and its administrative headquarters is Ari Atoll. It is said to have had several Buddhist structures. But at present, only two ruined structures lying southeast of the sea shore and measuring 3 m in height and 9 m and 8 m in diameter were noticed. The larger structure, a stupa, which had been disturbed earlier by digging was taken up for further examination. Three trenches measuring 5.00 X 4.00 m each, oriented east-west were laid out across the mound. The trial excavation was preceded by vegetation clearance of the mound. Four courses of dressed stones facing north were noticed. The excavated structure measures 1.60 m in length, 0.35 m in breadth and 0.37 m in height above the platform.

Kudahuvadu is situated south-southwest of Male. A number of loose dressed stones were reported from here near a mosque. The mosque is constructed of dressed stones probably taken from Buddhist ruins. Remnants of a Buddhist tank were also noticed. Recently recovered bronze lamp from the site can be compared with the same of the Chola period.

In order to reveal the Buddhist structures, three trenches measuring 400 X 2.00 m each were laid out in north-south direction, but these did not reveal any archaeological finds.

Kurumathi Island lies north-west of Male. The mound measuring 70 X 40 X2 m approximately having coral packing on the top was noticed. Two trenches measuring 10 X 10 m each were laid at the site in east-west direction. Of these, one trench yielded only potsherds of red ware, while the other trench lying at the top of the mound revealed an alignment of dressed stones in two courses at the depth of 50 cm. The ashlar stone walls are not of uniform size. These walls are running east-west and northeast direction measuring 27 cm to 48 cm in length, 38 cm to 45 cm in width and 10 cm to 25 cm in thickness. A few broken dressed stones carved with geometrical designs and offset and vertical mouldings were recovered during excavations. A few sherds of red ware were found scattered nearby the site. A number of contextual antiquities including different types of beads of agate, carnelian, coral, crystal and silver and gold ring foil and cowries, conch and a terracotta ram figurine were found encased in a squarish relic chamber of sandstone during earlier clearance. These antiquities are now kept in National Museum, Male.

Toddu is situated north-west of Male. The administrative headquarters of the Island is Rasdu Atoll. The Buddhist stupa site lies to the north-west of the Island. The stupa is in a better state of preservation in comparison to the other Buddhist remains of the Island. It is built up of dressed stones of beach rock which retain lime plaster covered over it. The stupa is raised over a circular drum in tiers. The drum of stupa is chracterized by vertical moulding. It measures 5.25 m in diameter. Dome of the stupa is partially missing. The stupa in enclosed by a square platform which in turn is upraised by a number of tiers in tapering fashion. The stupa faces east. The lower portion of the stupa has inset stone railing around the entire drum which has lime plaster. The Buddha head in the National Museum is reported to be brought from this place.

Nilandu North located south-west of Male in North Nilandu Atoll. The site was found to have a square platform having eight courses of dressed stones and an enclosure wall. The platform partially exposed by Loutfi and Thor Heyerdahl during their excavations in 1982. It was noticed here that the architectural parts of Buddhist structures have been added to a mosque and houses of the Island. The mosque stands close to the Buddhist remains.

The Island of Landu is situated north of Male and measures 0.5 X 1 km in area. A seven meter high mound was found indicating a stupa. It measures 30 X 30 m and is totally covered with corals.

A Buddhist establishment consisting of a stupa and other structures around it were noticed covered with coral stones in dilapidated condition. A number of potsherds of red ware and celadon ware were found to be surrounded by five to six other stupas covered with coral and marshy vegetation in an area of about 0.5 km.

In view of exposing the structures, a trial trench of 10 X 10 m was laid towards north-east. It revealed an entrance consisting of the basement decorated with mouldings. The basement is characterized by retaining stone casing in a line which is an abetment to the unexposed square platform of the stupa. Both the walls of entrance contain off-sets of tiles and dressed stones running north-south. The stones are lime plastered. However, the walls and their offsets were noticed in dilapidated condition showing crescentic stepping stone. In order to trace the moonstone, digging was extended to southern side where two broken stone slabs were found placed at right angle to the basement on either sides.

The staircase is sunken due to overlying debris. The pathway leading to the stupa measures 6 m in length and 2 m in width. The thickness of the wall is 40 cm having a seven courses with moulded base with crescentic stone as stepping stone to the entrance. The pathway joins an unexposed square platform.

The noteworthy finding was a fragment of a bowl with floral design on its lip in celadon ware collected during the clearance of the lower-most part of the basement.

Besides, a number of potsherds of red ware, glazed ware and celadon ware (fig. 10) were collected from Kurumathi, Kudahuvadu and Landu Islands during explorations and excavations. The shapes of ceramics include carinated bowl, jars, *handis* and lids. The red ware sherds are devoid of any slip or wash or any other colour designs. However, sherds of glazed ware and celadon ware show floral decorations. Among them one glazed ware sherds has a single perforation. The striation marks observed on the pottery indicate fast wheel manufacturing technique.

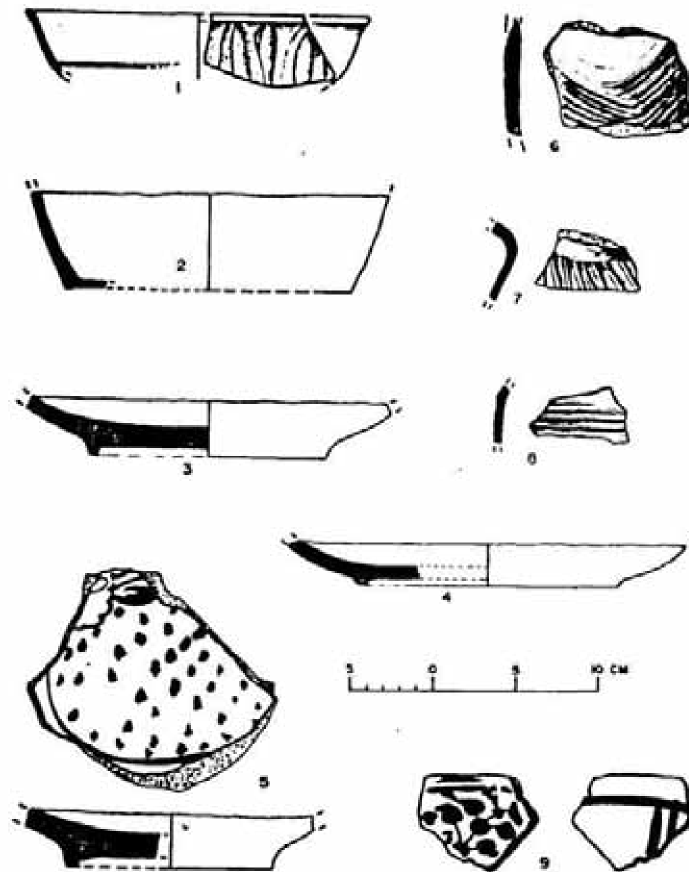


FIG. 10 : *Maldives: ceramics from Buddhist sites*

Occurrence of ceramics in the coral archipelago is significant as there are no clay deposits. It can be presumed that the clay and pottery was imported to these islands either from India or Sri Lanka.

PRESERVATION OF ANGKOR VAT TEMPLE, SIEM REAP, CAMBODIA

Under the cultural exchange programme signed between the Governments of India and Cambodia in 1986 a team of the Survey under the leadership of K.P. Gupta, assisted by Balbir Singh, C.S. Jayaramasundaram, Hanumantha Rao, B.R. Mukhopadhyay, B.S. Sood, A.K. Mathur, B.P. Sachdeva, Sovan Chatterjee, S.K. Sharma and S.M. Jain undertook the conservation of Angkor Vat temple. The main problems are growth of vegetation over the monument due to heavy monsoon; percolation of water; seepage of water, causing settlement of foundation resulting in sinking of walls and pillars ; damage by bats and insects; and cryptogamous growth like moss, lichens and algae. The temple being built of a coarse grained sandstone has been affected by all the above factors. The main items of work executed during the year under review are as under: *Structural Conservation*: The sunken and out-of-plumb sandstone blocks of the steps of northern embankment to the moat, facing west were reset and foundation reinforced with cement concrete up to a length of 20 m.

After dismantling the sunken members of the plinth and eradicating the plant alongwith roots, the foundation of the western gateway of the Fourth Enclosure was strengthened with cement concrete. The dismantled members were reset in their original position (pl. LX1II).

The successive pediments, above one of the subsidiary gateway to the north, were reset in proper alignment after dismantling.-A lintel below the semi-vaulted roof, between the northern subsidiary towers and the central tower broken in three places was joined together by providing concealed reinforced concrete. R.C.C. supports provided earlier were removed, as these were not in conformity with the architectural style. The entire wide open joints of the floor including cracks on the wall were grouted with liquid cement mortar and pointed, matching with the original colour. A cement concrete apron was provided at the basement to prevent seepage of water into the foundation at places near the western gate. Besides attending to the broken lintels and brackets all along the corridor of western gateway, the missing portions on the top of northern and southern subsidiary towers were closed and thus eliminated the seepage of water. Some of the damaged *apsaras* were also repaired (pl. LXIV). Apart from the above, the loose and dislodged architectural members of all the tiers of the central tower were refixed.

Excepting the two projected portions on the eastern and western sides, the cracks and joints of the basement and flooring of Northern Library between fourth and third enclosures were grouted with liquid cement. Out-of-plumb and sunken steps were reset. The semi-vaulted roof between north and north-east sides were dismantled, the missing lintels provided and then reset after providing the missing stones from the collection nearby. Fourteen lintels and brackets were repaired with dowelling or by cement concreting. Water outlets towards west and east were provided in the central hall. Drainage system between the fourth and third enclosures was recommissioned by levelling and dressing and providing brick masonry catchment pits within the areas. Apart from the structural and chemical preservation in repairing some of the damaged *apsaras* and decorative elements on the pilasters, doorjamb, etc., on the central gateway to the Fourth Enclosure, limited restoration was also carried out as per conservation norms.

Chemical Preservation: Chemical conservation was carried out both internally and externally on the western gateway. As a result, the growth of vegetation like moss, lichens and algae was eradicated. Smoky and tarry accretions were removed. Besides, cleaned areas were treated with polycide and fungicide and finally a preservative was applied over the treated areas. Chemicals used were a 5-10% aqueous ammonial solution of neutral Teepol B.300 in the proportion of 2 : 1; a 5% solution of triethanolamine teepol and neutral B.300 in water. Application of weed killer with a 1% aqueous solution of sodium was carried out. A 2% solution of polymethyl methacrylate in toluene was used as preservatives (pls. LXV-LXVII).

XI. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. SRI CHINTALA VENKATARAMANASVAMI TEMPLE, TADIPATRI, DISTRICT CUDDAPAH.—The paintings affected by dust, dirt, soot and other accretions were cleaned chemically and treated area preserved. Consolidation and filleting were also carried out wherever necessary.

2. RAMAPPA TEMPLE, PALAMPET, WARANGAL.—In continuation of last year's work *(1985-86,p.* 193), vegetation growth and thick layer of lime wash was removed from sculptures by chemico-mechanical means and the cleaned area was finally preserved after fungicidal treatment. The work is in progress.

ASSAM

3. BISHNUDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—Thick layers of moss and lichen were chemically removed by using solutions of ammonia and detergents. Fungicidal treatment with zinc silico-fluoride and weed-killer was carried out to the cleaned surface followed by preservative coat of polyvinyl acetate. The work is in progress.

4. DEVIDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—Chemical conservation and preservation for the removal of thick layers of microphytes was completed by using aqueous ammonia and liquid detergent solutions. Fungicidal treatment with weed killer was given to check the regrowth of vegetations and the whole area was finally preserved with 4% solution of polyvinyl in toluene.

5. SIBDOL TEMPLE, SIBSAGAR, DISTRICT SIBSAGAR.—The chemical treatment for the removal of thick layers of moss, lichen etc., was continued using aqueous ammonia and liquid detergent solutions together with other chemicals viz.,-oxalic acid, hypo, etc. A fungicidal coat of zinc silico-fluoride was given to the treated area followed by preservation with 4% solution of polyvinyl acetate in toluene.

BIHAR

6. STUCCO FIGURES AND PLASTER IN TEMPLE 3, NALANDA, DISTRICT NALANDA.—The work of removal of moss, lichen and dust, etc. was resumed and completed by using chemicals such as liquid ammonia, detergent water, etc., and cleaned area was finally preserved after fungicidal treatment.

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[1]Information from the Chemical Branch of the Survey.

DAMAN AND DIU

7. FORT, MOTI DAMAN, DAMAN.—Chemical treatment of paintings in Holy Jesus and Lady Rosario churches at Moti Daman Fort was carried out. Gilded work on the pulpits and around the statues of Jesus Christ were also chemically treated.

GOA

8. ST. FRANCIS OF ASSISI CHURCH, VELHA GOA.—The accumulated dust, dirt, etc., from the beautifully gilded huge wooden alters, pulpits, murals/canvas/panel paintings have been removed with very soft feather/sable hair brushes and paintings chemically cleaned with suitable solvents preserved. Canvas of one of the paintings was repaired and retouched. Gaps of two panel paintings have been filled with plaster of Paris and retouched with suitable oil colours.

GUJARAT

9. SAHAR KI MASJID, PAVAGADH, DISTRICT CHAMPANER.—The thick growth of moss and lichen from the exterior and the front portions of the mosque were removed chemically, then cleaned and preserved. The pillars of outer verandah of the mosque and the lower portions of richly carved minarets were chemically cleaned.

10. GALTESVARA TEMPLE, SARNAL, DISTRICT KHEDA.—The elaborate chemical treatment and preservation work of sculptures and carvings on the outer wall of the main temple was carried out for the removal of old and hard incrustations of lime plaster, moss, lichens, etc., and details of beautiful small sculptures and carvings were brought to light. Consolidation and preservation work of the deteriorating sculptures have also been completed.

HARYANA

11. IBRAHIM'S TOMB, NARNAUL, DISTRICT MAHINDERGARH.—The surface of interior walls which were covered with dust, dirt, greasy matter, smoke, etc., were treated chemically as well as chemico-mechanically. At certain places ammonical solution was applied to remove vegetational growth. Approximately 20% area has been treated and preserved.

HIMACHAL PRADESH

12. NARBADESWAR TEMPLE, SUJANPUR, DISTRICT HAMIRPUR.—The paintings on the outer walls of the temple, facing south, west and north were subjected to chemical treatment with organic solvents followed by preservation with polyvinyl acetate in toluene. The work is in progress.

13. BUDDHIST MONASTERIES, TABO, DISTRICT LAHAUL AND SPITI.—The paintings on the wall facing entrance gate of Kyilkhang were subjected to chemical treatment with organic solvents and were

preserved with 3% poly vinyl acetate in toluene. The filleting and filling of cracks, holes, etc., was also done. Documentation of the treated portion has also been carried out and completed (pls. LXVIII-LXIX). Paintings on the side wall of the entrance gate of Bromton Lhakhang were treated with organic solvents after preliminary dusting. Cleaned area was preserved with 3% solution of polyvinyl acetate in toluene. Filleting and filling of gaps and cracks was done followed by colour matching to the treated area. Documentation works were also carried out and completed.

14. SANDHYA GAYATRI DEVI AND MINIATURE SIVA TEMPLES, JAGATSUKH, DISTRICT KULLU.—Siva temple and some portions of Sandhya Gayatri Devi temple were chemically cleaned with dilute ammonia and detergent solution with soft brushes. The work is in progress.

JAMMU AND KASHMIR

15. SIVA TEMPLE, PANDRETHAN, SRINAGAR, DISTRICT SRINAGAR.—The outer surface of the temple was chemically treated with dilute solution of ammonia and liquid detergent with the help of soft nylon brushes.

KARNATAKA

16. ASAR MAHAL, BIJAPUR, DISTRICT BIJAPUR.—The superficial accretions and vegetational growth from the stucco and stone sculptures were removed by using aqueous ammonia and teepol followed by the application of fungicide sodium pentachlorophenate and preservative, polyvinyl acetate in-toluene. The old transluscent preservative coatings were removed by using diacetone alcohol, di-butyl phthalate and turpentine followed by the application of preservative in toluene. The work is in progress.

17. AMRITESVARA TEMPLE, AMRITAPURA, DISTRICT CHIKMAGALUR.—Eradication of thick vegetational growth was carried out from the *vimana,* its exterior wall and that of *navaranga* and *sukanasi* by using 5% aqueous ammonium hydroxide with teepol. An area of 186 sq. m. was thus chemically treated and preserved with 2% polyvinyl acetate solution in toluene after the application of 1% aqueous solution of sodium penta-chlorophenate.

18. VIDYASANKARA TEMPLE, SRINGERI, DISTRICT CHIKMAGALUR.—In continuation of last year's work *(1985-86,* p. 196) the soot and oily matters from the *navaranga* were removed by using 5% aqueous solution of non-ionic detergent. The treated area was finally preserved using 2% solution of polymethyl-methacrylate in toluene.

19. GROUP OF TEMPLES, LAKKUNDI, DISTRICT DHARWAR.—The lime wash and vegetational growths was removed with the help of dilute acetic acid and aqueous solution of ammonia. The work is in progress.

20. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.—Ingrained lime wash coating in *dalan* was removed chemico-mechanically using a 5% aqueous solution of acetic acid followed by general

cleaning with an aqueous solution of non-ionic detergent mixed with ammonium hydroxide. The cleaned area and eastern tower were applied with 1% aqueous solution of sodium pentachlorophenate followed by preservation with 2% solution of acrypol in toluene. The work is in progress.

KERALA

21. MATTANCHERRY PALACE, COCHIN, DISTRICT ERNAKULAM.—The murals covered with dust, dirt, dark patches and old preservative, which had turned yellow due to aging were removed by using various solvents like diacetone alcohol, cellosolve, butyl lactate etc. The consolidation and filleting work were also carried out wherever necessary. The entire area was preserved with 1-5% poly vinyl acetate in toluene.

MAHARASHTRA

22. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—To eradicate the insect activity in the Caves 1, 16 and 17, fumigation was carried out with ethylene dioxide and carbon-di-oxide gases in 1: 9 mixture. The rate of gas was kept 1.35 kg/1000 c.ft. Insect activity was checked. Pyrethrum (0.25%) has been sprayed in Cave 1, 12, 16 and 17 as insect repellent.

The dust, dirt and thick coat of mixture of old varnishes, etc., over the paintings of pillar 6 and east wall of Cave 17 were removed chemically and the treated portions were preserved with 2% solution of polyvinyl acetate in toluene having little di-butyl phthalate.

Consolidation of loose plasters and paintings filling up of cracks, fixing up edges with plaster of Paris, fevicol and polvinyl acetate was carried out in Cave 2 and 9. Routine monitoring of temperature, relative humidity, moisture contents in rock and plaster etc., were also carried out in different caves.

23. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—Chemical treatment and preservation of paintings in Cave 12 and *dhvaja stambha* and sculptures *around pradakshina* and eastern wall paintings in Cave 16 were carried out and preserved by using 1 to 2% polyvinyl acetate in toluene. The accretions over the sculptures in Cave 10 were removed and chemically treated.

24. ROCK-CUT CAVES, KANHERI, DISTRICT BOMBAY.—The vegetation growth in Cave 1,2 and 3 was removed with the help of 1% aqueous ammonia and non-ionic detergent. After chemical cleaning 3% aqueous solution of zinc silico-fluoride was sprayed followed by preservative of 5% solution of acrypol in toluene. The interior of Cave 3 covered with thick layer of dust, dirt, bird droppings, etc., was also chemically treated.

25. ELEPHANTA CAVES, GHARAPURI, DISTRICT KOLABA.—The filling up of cracks and consolidation of loose portions with epoxy resin and rock powder mixture, salt extraction with paper pulp method, chemical cleaning with 0.5% aqueous ammonia and 1 % detergent liquid was carried out. Cleaned areas were then preserved with 3 to 5% solution of acrypol in toluene.

26. GORDESHWAR TEMPLE, SINNAR, DISTRICT NASIK.—Stone sculptures and stone surface of the temple were affected by the accumulation of thick layers of dust, dirt and heavy growth of moss, lichen and bird droppings. Cracks and loose portion were also found at several places.

Filling of cracks and consolidation of loose portions was done with epoxy resin and rock powder mixture/silica flour with matching colour and removal of moss, lichen, bird droppings, etc., have been successfully carried out by using 2 to 3% aqueous solution of ammonia and 2% solution of neutral detergent in water. Some patches of strongly adhered lichens were removed by chemico-mechanical means. After cleaning, a 2% solution of sodium pentachlorophenate in water was sprayed as fungicidal followed by a coating of 3% solution of acrypol-p in toluene as preservative. The work is in progress.

27. FORT, RAIGAD, DISTRICT RAIGAD.—Chemical conservation of Jagdeshwar Temple was initiated and completed. The thick layers of dust, dirt, moss and lichen were removed by brushing with a mixture of 3 to 5% aqueous solution of liquid ammonia and 2% solution of neutral detergent in water with coir brushes. After chemical cleaning, the fungicidal treatment was carried out by spraying a 3% aqueous solution of zinc silico-fluoride, followed by preservation with 3% solution of acrypol-p in toluene.

NAGALAND

28. DIMAPUR RUINS, DIMAPUR, DISTRICT DIMAPUR.—The stone sculptures at Dimapur ruins, were covered with dust, dirt and thick growth of moss and lichen. The vegetational growths were removed with dilute solution of ammonia and detergent mixture. The cleaned structures were given fungicidal treatment with aqueous solution of zinc silico-fluoride and finally preserved with a solution of polyvinyl acetate in toluene. The work is in progress.

ORISSA

29. RAJA-RANI TEMPLE, BHUBANESWAR, DISTRICT PURL—The work of removal of thick vegetational growth, especially of green variety of lichen was carried out with 1 to 2% solution of aqueous ammonia. The cleaned area was applied with 2% zinc silico-fluoride in water followed by preservative coat of 1.5% solution of methyl methacrylate in toluene.

30. JAGANNATHA TEMPLE, PURI, DISTRICT PURL—Removal of lime accretions after deplastering the surface of vertical wall of *vimana* was initiated using 2% aqueous solution of acetic acid by chemico-mechanical methods. The work is in progress.

31. NARASIMHA TEMPLE, JAGANNATHA TEMPLE COMPLEX, PURI, DISTRICT PURL—The chemical treat ment work for the removal of lime accretions from deplastered surfaces of *vimana* of the temple was continued. After removing the lime accretion, the surface was treated with ammonical teepol solution. Cleaned surface was further given fungicidal coat of 2% sodium penta-chlorophenate in water followed by 2% solution of methyl methacrylate in toluene as preservative.

32. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT PURL—The moss and lichen of the *vimana* was chemically treated by using 2% solution of aqueous ammonia and the cleaned area was given fungicidal coat of 2% solution of zinc silico-fluoride in water followed by 2% solution of methyl methacrylate in toluene as preservative.

33. SUN TEMPLE COMPLEX, KONARAK, DISTRICT PURI.—Dried blackened layers of moss and lichen on the upper half of the *natamandira* were removed. Treated portions of Mayadevi temple were given fungicidal treatment with 2% solution of zinc silico-fluoride followed by application of 1.5% solution of methyl methacrylate in toluene. The work is in progress.

RAJASTHAN

34. KALIKA MATA TEMPLE, CHITTAURGARH, DISTRICT CHITTAURGARH.—The old hard incrustations of lime plaster on the walls of the *pradakshina patha* of the temple were removed using different chemicals and the details of sculptures and carving exposed.

35. SAMBHAVANATHA TEMPLE, JAISALMER, DISTRICT JAISALMER.—Chemical treatment and preserva tion of the stone carvings and sculptures, inside Sambhavanatha temple, were carried out using different chemicals and preserved.

UTTAR PRADESH

36. ITIMAD-UD-DAULA, AGRA, DISTRICT AGRA.—The paintings on the walls of southern verandah covered with surface accretions of dust, dirt and greasy matters were subjected to chemical treatment, old preservative, applied long back which had turned yellow, was removed with toluene. Further cleaning was done with the help of suitable organic solvents, methoxy methanol, triethanolamine and denatured spirit, etc. Finally the paintings were preserved with 3% solution of polyvinyl acetate in toluene.

37. TAJ MAHAL, AGRA, DISTRICT AGRA.—The marble surface of upper arches inside main cenotaph, was covered with superficial accretions of dust, dirt, soot and other atmospheric pollutants causing yellowishness, was chemically cleaned with a mixture of different chemicals and mud pack of magnesium trisilicate and aluminium silicate. The original colour of marble has been restored.

The lower arches on exterior wall of the main building of the Taj was covered with surface accretions of dust, smoke and other oily matters which have been chemically cleaned with ammonia, teepol and organic solvents followed by clay pack technique. The results thus obtained were very encouraging in restoring the original white colour of marble. The work is in progress.

38. KHUSRUBAGH, ALLAHABAD, DISTRICT ALLAHABAD.—The work of chemical cleaning for the removal of moss, lichens and other accretions of dust and dirt over the exterior dome of Prince Khusro's tomb was carried out by using aqueous ammonia and teepol in varying concentrations followed by

fungicidal treatment with-3% zinc silico-fluoride after which polyvinyl acetate solution in toluene was used as a preservative. The work is in progress.

39. JAGESVARA TEMPLE, ALMORA, DISTRICT ALMORA.—Moss, lichen and thick vegetational growth over the temples were chemically cleaned by using aqueous ammonia solution fixed with non-ionic detergent teepol. A fungicidal coating of 5% zinc silico-fluoride solution was applied followed by 3% polyvinyl acetate in toluene as preservative. The work is in progress.

40. BARA IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.—The lime plastered surface of the main building, covered with moss, lichen and other surface accretions were chemically eliminated with the help of 2% aqueous ammonia mixed with teepol. Fungicidal treatment with 3% zinc silico-fluoride was given to check further vegetational growth. Cleaned surface was finally preserved with 3% solution of polyvinyl acetate in toluene. The work is in progress.

41. RUMI DARWAZA, LUCKNOW, DISTRICT LUCKNOW.—The Rumi Darwaza was subjected to elaborate chemical treatment for the eradication of moss, lichen, dust, dirt, etc., with the help of aqueous solution of ammonia and teepol in varied concentrations. After successful cleaning of the huge gate, all the details of original architecture exposed. The work is in progress.

42. DHAMEKH STUPA, SARNATH, DISTRICT VARANASI.—After completion of conservation work of the brick structure at the top of the Dhamekh Stupa, fungicidal treatment with zinc silico-fluoride followed by preservation was carried out.

43. MOOLAGANDHAKUTI VIHARA, SARNATH, DISTRICT VARANASI.—The chemical treatment to eradicate vegetational growth from brick-wall and stone pillars was carried out using liquid ammonia and detergent. Fungicidal treatment with zinc silico-fluoride solution was followed by preservative coat.

WEST BENGAL

44. SYAMA RAI TEMPLE, BISHNUPUR, DISTRICT BANKURA.—Removal of thick layer of moss and lichens from terracotta figures was carried out by using aqueous solution of ammonia and teepol. The cleaned area was preserved with polyvinyl acetate solution in toluene after fungicidal treatment with zinc silico-fluoride.

45. RASAMANCHA, BISHNUPUR, DISTRICT BANKURA.—The work at the Rasamancha was taken up for the removal of black layers of dried moss and lichens by using ammonia and teepol. The cleaned area was given fungicidal coating of zinc silico-fluoride and then followed by preservation with polyvinyl acetate in toluene. The work is in progress.

46. HAZARDUARI PALACE MUSEUM, MURSHIDABAD, DISTRICT MURSHIDABAD.—The chemical treat ment and preservation work of museum objects such as armoury, oil paintings, chandeliers marble objects and fumigation of library books was carried out in phases in order of priorities.

Three hundred and fifty armed objects such as swords, guns, battle-axes, spears, daggers, pistols, shields, cannon with and without wheels were chemically treated. One chandelier of the Durbar hall was treated for removal of dust, dirt and other accretions. Thirty-five paintings both on canvas and panels affected by dust, dirt and darkening of old varnish were chemically cleaned and repaired and preservatives applied (pls. LXX-LXXII). The marble throne and flower vases etc., were also chemically treated since these were affected by dust, dirt, grease and other similar accretions and finally preserved. Dusting and fumigation work of two hundred library books was carried out.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

47. Three hundred and forty-six copper coins (three hundred and twenty-two from Sanghol, fifteen from Sringaverapura and nine from Purola excavations) were chemically cleaned by using 5% alkaline tartrate solution for eliminating the incrustations after removing the superficial layers of dirt, dust, etc., with water. The coins were then dipped in a dilute solution of H2SO4 and then cleaned with brush and water. This process was repeated till the coins were cleaned. Thereafter, these were put in running water in order to remove the last traces of alkali/acid and tested by litmus paper/methyl orange/ phenolphthaline solution etc., and finally boiled in distilled water, dried and preserved by 1-2% polyvinyl acetate in toluene.

48. Ninety-five iron antiquities including fifty-three from Sanghol and forty-two from Sringaverapura excavations were chemically treated for the removal of superficial dirt, dust and the deposited accretions by using chemicals like 5-10% sodium hydroxide solution and dilute sulphuric acid. The antiquities were cleaned by brushing and washing with water. This process was repeated till the antiquities were cleaned in all respects. The antiquities were kept under running water for removal of alkali/acid, the presence of which was tasted by indicators. Finally the antiquities were placed in boiled distilled water, dried and preserved by petroleum jelly.

49. Forty-five different antiquities from Hazarduari palace, Murshidabad, were also chemically cleaned and preserved.

50. Sixteen copper coins and three antiquities received from the Hampi Museum and six bronzes from the Madras Circle of the Survey were chemically treated and preserved.

51. One thousand eight hundred and eight coins, six silver ornaments, forty stone images from Shivpuri Museum, twenty stone images from Vidisha Museum, few wall paintings from Kharbua Mahal, Dhar and replicas of paintings of Bagh cave from Gwalior Museum were chemically treated and preserved.

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[1]Chemical treatment carried out by: 47-50,54-55, Chemical Branch of the Survey; 53, Department of Archaeology and Museums, Rajasthan ; 52, Manipur State Government; and 51, Department of Archaeology and Museums, Madhya Pradesh.

52. Seven silver objects from Baboiching, Chingmeirong, District Imphal were also treated and preserved.

53. Two thousand silver coins; seventy stone sculptures from Dungarpur, Jaipur, Kota and Pali Museums; thirteen miniature paintings from Bikaner Museum; four each of polychrome wooden boxes and brass images; and twelve portaits of the Jaipur State from Albert Hall, Jaipur, were chemically treated and preserved.

54. Three hundred and twenty-five pages of Urdu *Quran* were separated form a solid lump by using alcohol and water. These pages were fumigated with p-dichlorobenzene, deacidified with ammonia and cleaned by using different organic solvents depending upon the nature of the incrustation and preserved. These pages were strengthened and further protected from the decaying agencies like environment and insects etc., by enveloping them in butter paper with moderate transparency.

55. One hundred and thirty-five books were also fumigated and deacidified.

ANALYSIS AND RESEARCH[1]

56. Analysis of fifteen marble specimens taken from the Taj were also conducted by conventional wet method and by using most sophisticated instruments like A AS, SEM and IR and UV spectrometer. Thirteen specimens of surface deposits were also analyzed for the identification of the film formed on the surface due to the variation of the environment as well as particulate. settlement by using the most modern and sophisticated instrument SEM. Thirteen specimens from various spots were analyzed for the detection of PVA or methyl methacrylate by using different techniques, such as IR, TLC. All these gave negative results. One fibrous material and a piece of wood from plaster were also examined and identified. The black deposit on the filter paper at the Taj, Agra was chemically analyzed and found to be soot due to the burning of fossil fuel.

57. One specimen of fibre from the Datia palace was examined microscopically and identified as grass straw or weed.

58. Ten metallic specimens consisting of brass and one of iron from Sanghol excavation were analyzed by conventional wet and ASS (to estimate trace elements) and X-ray diffraction (to ascertain the lattice structures) methods.

59. Two glass samples from Bhagwanpura excavations were also chemically analyzed by conventional method for the composition and traces of the elements present e.g. Ni, Mn, Cu, Zn, etc.

60. One brick sample was analyzed for its chemical and minerological composition, firing temperature, mass properties, such as density, porosity, permeability, mechanical strength etc., which were determined for the suitability, durability and resistivity against the surface action phenomenon.

[1]Information from: Director (Science) of the Chemical Branch of the Survey.

61. Sixteen samples of decayed stone from Khajuraho (twelve from the Javari temple and four from the Vamana temple) were analyzed for their chemical and minerological composition by conventional wet methods and by using SEM. Physical parameters such as porosity, density, permeability and capillary action etc., were also determined in order to find the change in chemical and minerological composition and the effect on the physical properties due to this change.

62. Five specimens of laterite from Goa were analyzed by X-ray diffraction for the minerological composition and the size and shape of the minerals present. One specimen of plaster from St. Cajetan, Goa, was chemically analyzed for its composition and traces of element present, in order to explore the causes of its decay.

63. Twenty pottery samples from Bhagwanpura excavations and one from Harappa were analyzed by conventional method, SEM and X-ray diffraction for their chemical and minerological composition. Physical parameters such as density, porosity, penetrability, permeability etc., were also determined in order to find the type of clay used and techniques applied.

The variation of porosity wit' the firing temperature was also studied. It was found that porosity has a direct correlation with firing temperature to some extent and then comes to the middle range.

64. Three stone samples, a deteriorated one from the Dwarka temple and two fresh from two quarries, Chaubari and Charwa near Dwarka were chemically analyzed for their chemical and minerological composition and the traces of anions e.g. chloride, nitrate, sulphate, phosphate, etc., present. Mass properties such as porosity, permeability, density, capillarity and their crushing strength were determined in order to find the suitability, durability and resistivity against surface active agents present in the surrounding areas for replacement of decayed ones.

65. Five specimens from monuments and from nearby quarries were chemically analyzed for their composition to find the change in composition due to pollution in the environment.

66. Two stone specimens, one decayed and one fresh from Elephanta cave were analyzed for their composition in order to find the change which has occurred in the decayed stone due to salinity and other factors including inherent ones with respect to the fresh one.

67. Analysis of eleven pigments viz., three from Narbadeshwar temple, one from Khandagiri, two each from Sringavaran and Vaikuntha temple, Kanchivaram, one each from Bishnupur temple, Ajanta cave and Agra Fort were also conducted for their composition and binding medium by conventional methods and T.L.C.

68. One specimen of pigment from Vaikuntha temple, Kanchivaram, was studied for its nature.

69. Eight textiles taken from Hazarduari Palace, Murshidabad, were studied microscopically for the identification of fibres and colours.

70. In order to keep surveillance of long and short term effects of injurious sulphur dioxide, the Air Pollution Laboratory of the Survey is monitoring its concentrations at Taj and Sikandara using sulphur dioxide monitors. Particulate matters viz., smoke, tarry matters, dust, dirt and alkali matters, etc., which bring about soiling and disfigurement of the monument are also being monitored. Complete record of the behaviour of preservatives is also being maintained at site which determine the efficiency of different preservatives.

XII. ARCHAEOLOGICAL GARDENS[1]

ANDHRA PRADESH

1. ARCHAEOLOGICAL MUSEUM, AMARAVATI, DISTRICT GUNTUR.—The garden around the museum area was well maintained.

2. TRANSPLANTED STRUCTURES AND ARCHAEOLOGICAL MUSEUM, NAGARJUNAKONDA, DISTRICT GUNTUR.—The garden around the site and museum was maintained properly.

3. FORT, GOLCONDA, DISTRICT HYDERABAD.—The garden around the fort was maintained nicely.

BIHAR

4. STUPA, VAISHALI, DISTRICT VAISHALI.—In order to facilitate the water supply in the garden, a pumping-set was installed.

DELHI

5. HUMAYUN'S TOMB, DELHI.—The garden around the tomb was maintained nicely and new plants and trees introduced.

6. JANTAR MANTAR, DELHI.—The garden has been kept in presentable condition.

7. KHAIRUL MANAZIL, DELHI.—The garden has been well maintained.

8. KHAN-I-KHANAN'S TOMB, DELHI.—The garden around the monument was maintained properly and new plants viz., *thujas, polyalthea pendula,* etc., introduced.

9. LODI TOMBS, DELHI.—The garden has been kept in a presentable condition.

10. NAZAF KHAN'S TOMB, DELHI.—The garden has been maintained properly during the year under review.

11. PURANA QILA, DELHI.—Efforts have been made to keep the garden in a presentable way.

12. QUTB COMPLEX, MEHRAULI, DELHI.—The garden in the Qutb complex was kept neat and clean during the year under review.

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[1] Information from: 30,32 and 35-37, Director, Archaeology and Museums, Rajasthan; and the rest from the Chief Horticulturist of the Survey.

13. RED FORT, DELHI.—The garden was well maintained.

14. SAFDARJUNG TOMB, DELHI.—The garden was kept in a presentable way throughout the year.

GUJARAT

15. ANCIENT SITE, LOTHAL, DISTRICT AHMEDABAD.—The garden has been kept neat and clean throughout the year.

16. HAZIRA TOMB, VADODARA, DISTRICT VADODARA.—The garden was well maintained.

HIMACHAL PRADESH

17. BAIJNATH TEMPLE. BAUNATH, DISTRICT KANGRA.—The garden has been maintained nicely.

JAMMU AND KASHMIR

18. MARTAND TEMPLE. DISTRICT ANANTNAG.—The garden around the monument has been well maintained throughout the year.

19. PATHAR MASJID, SRINAGAR, DISTRICT SRINAGAR.—The garden was maintained in a presentable way.

20. SANKARACHARYA TEMPLE, SRINAGAR, DISTRICT SRINAGAR.—The garden was kept in a presentable condition during the year.

KARNATAKA

21. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—The work of landscaping around Jaina and Kedaresvara temple was also taken up to improve the environment. New plants such as *Areca cattachu (supari), Michelia champaea* and *Plumeria alba* have been introduced.

22. DARIYA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.—In order to provide the water supply to the orchard area, drip irrigation system was introduced. Returfing and re-orientation work was also taken up.

23. GUMBAJ, SRIRANGAPATNA, DISTRICT MANDYA.—The garden was maintained in a presentable condition.

MADHYA PRADESH

24. HAMMAM AND FORT, BURHANPUR, DISTRICT EAST NIMAR.—The garden was well maintained throughout the year.

MAHARASHTRA

25. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—The garden around the monument was well maintained.

26. SHANWARWADA, PUNE, DISTRICT PUNE.—The garden was properly maintained.

ORISSA

27. SUN TEMPLE, KONARAK, DISTRICT PURI.—In order to improve the environment and to check saline winds, seven thousand new plants/shrubs were planted along the archaeological area.

28. JAGANNATHA TEMPLE, PURI, DISTRICT PURL—A submersible pumping set has been installed in the Baikuntha Dam area to improve the irrigation facilities in the shrub garden of the site.

PUNJAB

29. FORT, BHATINDA, DISTRICT BHATINDA.—The garden has been maintained nicely during the year under review.

RAJASTHAN

30. AKBAR'S FORT, AJMER, DISTRICT AJMER.—Besides general maintenance of the garden around the monument, seasonal plants and flowers were also planted.

31. ANASAGAR BARADARI, AJMER, DISTRICT AJMER.—The garden was kept in a presentable condition.

32. CHAMAN BAGICHI, BHARATPUR, DISTRICT BHARATPUR.—The small garden was kept in present able way.

33. DIG PALACE, DIG, DISTRICT BHARATPUR.—Both the palace garden and the Kachha Bagh were maintained nicely.

34. FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.—The garden around the fort-complex was well maintained and further development of garden is in progress.

35. JALEB CHAUK, AMBER, DISTRICT JAIPUR.—The garden was well maintained throughout the year.

36. CENOTAPH, AMBER, DISTRICT JAIPUR.—A garden was laid out and the boring of well is in progress.

37. PALACES, AMBER, DISTRICT JAIPUR.—The lawns around the palaces were well maintained.

TAMIL NADU

38. BRIHADISVARA TEMPLE-, THANJAVUR, DISTRICT THANJAVUR.—The landscaping work in archaeo logical area between Sivaganga little fort wall and temple *prakara* wall has been completed. The garden is being maintained in presentable condition.

39. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHCHIRAPALLI.—An informal garden is being developed inside the compound wall.

UTTAR PRADESH

40. FORT, AGRA, DISTRICT AGRA.—Jungle clearance of more then ten acres of land has been completed. Ornamental shrubs and canna beds were laid out towards the back side of Akbari Mahal and Saman Burj to create the pleasing environment.

41 AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—P. V.C. pipe lines have been laid out to facilitate the irrigation system in the garden.

XIII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. INDIAN ARCHAEOLOGY- A REVIEW.—The issue for 1983-84 was published and the one for 1984-85 was sent to the press.

2. ANCIENT INDIA.—Numbers 15 to 21 were reprinted.

3. ANNUAL REPORT ON INDIAN EPIGRAPHY.—The issues for the years 1973-74, 1975-76 and 1977-78 were published, and eleven volumes from 1915 to 1965 were also reprinted.

4. EPIGRAPHIA INDICA —Six volumes, XXIX to XXXIV are in advanced stage of printing.

5. EPIGRAPHIA INDICA-ARABIC AND PERSIAN SUPPLEMENT.—Twelve volumes, 1913-20 to 1970-71 were sent to the press for reprinting.

6. SOUTH INDIAN INSCRIPTIONS.—Volume XXIV was brought out and ten volumes from IV to XII were reprinted.

7. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—Number 83, *Daimabad* by S.A. Sali, number 84. *Panhale Kazi* by M.N. Deshpande, and number 85, *Nagda* by N.R. Banerjee were published.

8. ARCHITECTURAL SURVEY OF TEMPLES SERIES.—*Temples of the Pratihara period in Central India* by R.D. Trivedi and *Temples of Khajuraho* by K. Deva were sent to the press.

9. AJANTA MURALS.—*Ajanta Murals* edited by A. Ghosh was reprinted.

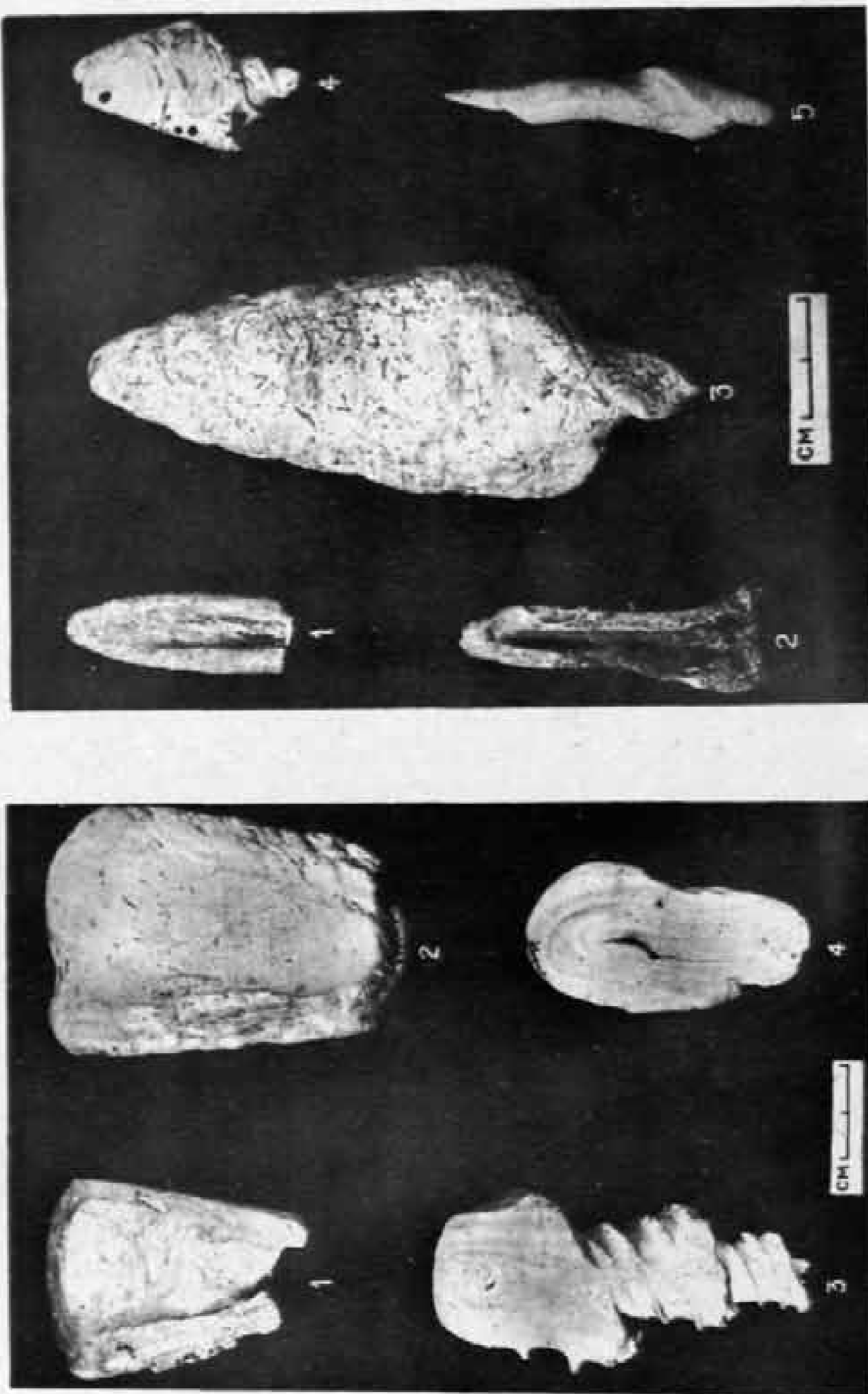
OTHER PUBLICATIONS

ANDHRA PRADESH.—The Department of Archaeology and Museums, Government of Andhra Pradesh, brought out *Annual Report, 1981-82* and *Journal of Andhra Historical Research Society,* Volume 38, Part IV, during the year under review.

MADHYA PRADESH.—The Department of Archaeology and Museums, Government of Madhya Pradesh, brought out: *Malwa Janapadiya Sikke, Tumain Excavation report, Puratana,* volume 5 and booklets on Hinglajgarh Fort and Archaeology and Museums.

RAJASTHAN.—The Department of Archaeology and Museums, Government of Rajasthan, brought out a brochure entitled *Exhibition of Masterpieces from Reserve Collection* on the occasion of centenary celebrations of the Central Museum, Jaipur.

WEST BENGAL.—The Department of Archaeology and Museums, Government of West Bengal, published *Medinipur Jelar Pratnasampad* by Pranav Ray, *Purakirti Samiksha-Medinipur* by Tarapada Santra and *Memoirs of Gaur and Pandua* by (late) Abid Ali with a prolegomena by Anirudha Ray and Chinmay Datta during the year.



A B

Andaman and Nicobar Islands : A, *shell objects from Knappuram I (1), Namunaghar II (2), Pormout VI (3), and Chouldari I (4)*; B, *shell and bone tools from Knappuram I (1), Pormout III (2), Mithakhari V (4&5) and Pormout VI (4).* *See p. 7*



A

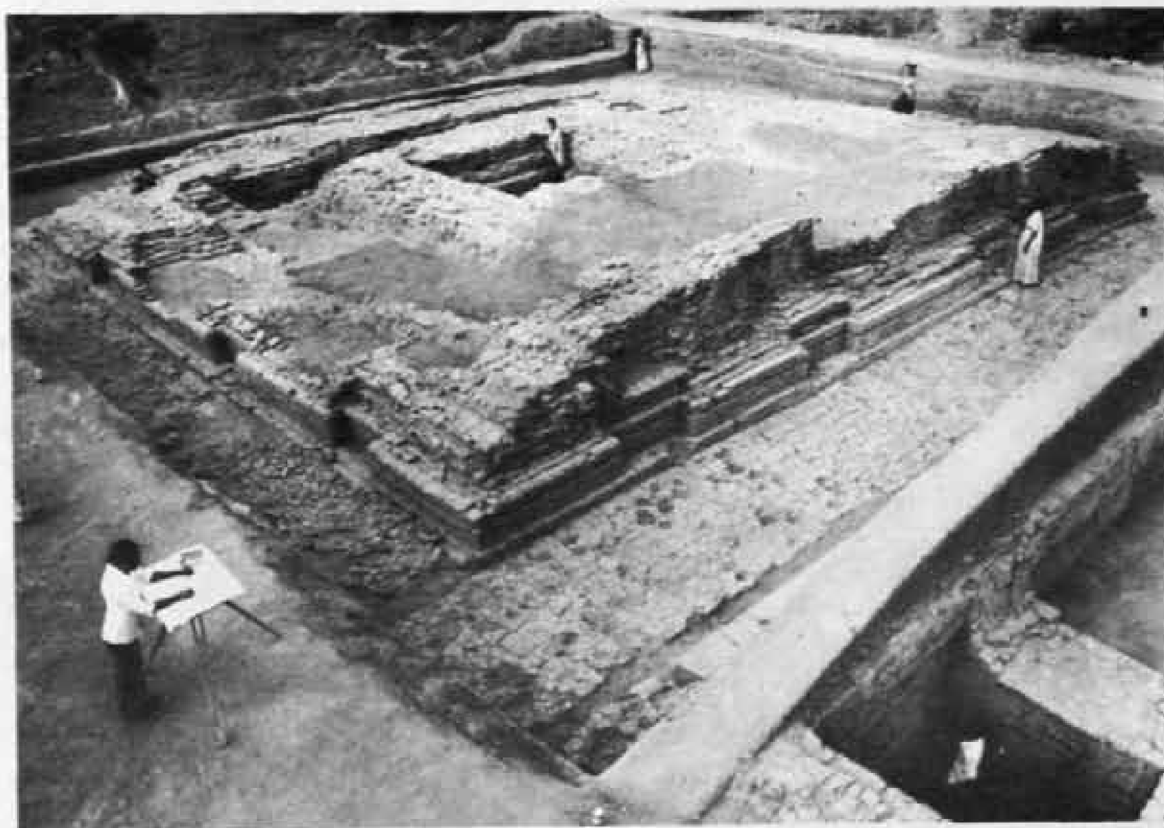


B

A, *Pashgaon : ornamented limestone encasement of circular chaitya;* B, *Govindaraopet : image of Bhuvaraha in limestone.* *See pp. 10 and 13*

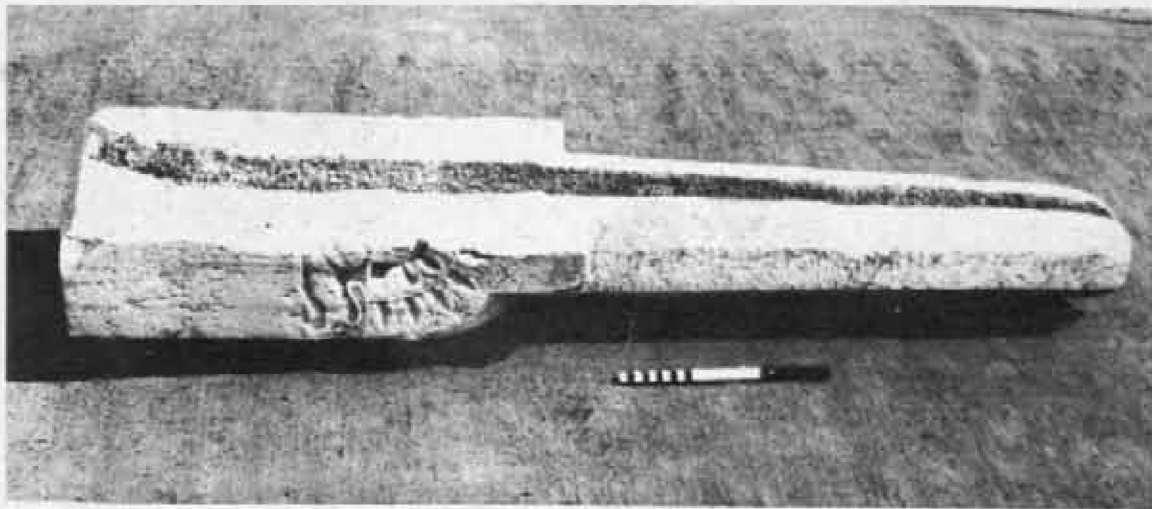


A

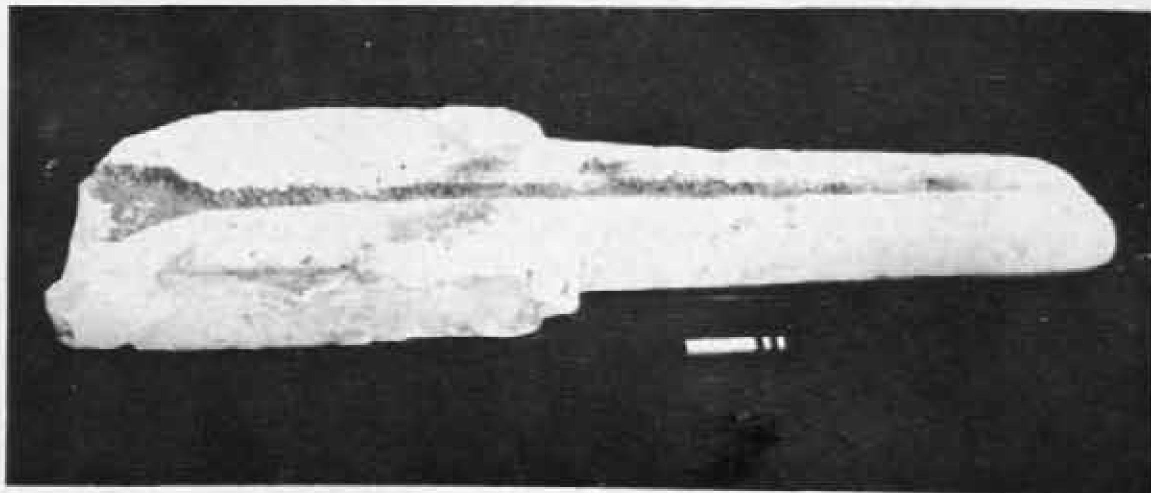


B

Peddavegi : A, *exposed adhishthana, south face*; B, *view of panchayatana temple, Phase IB*. *See p. 17*



A



B

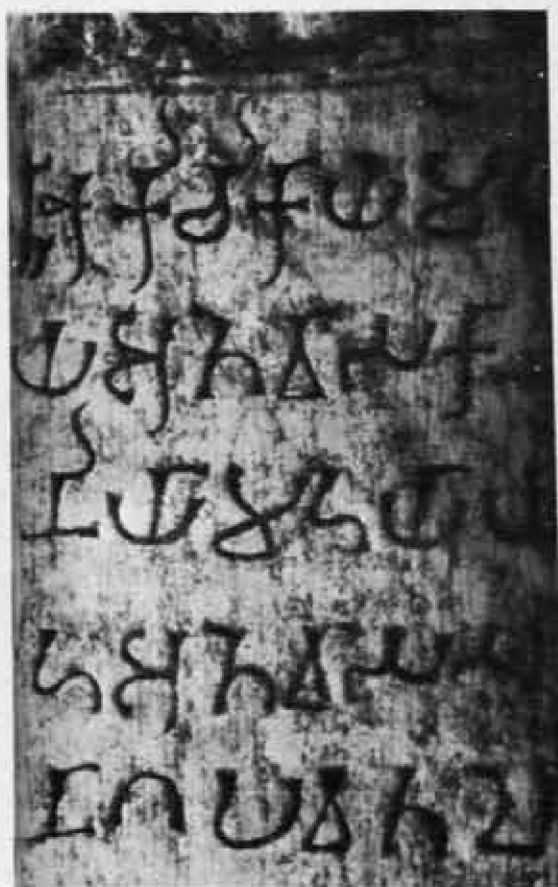
Peddavegi : limestone pranalas, third century AD. See p. 19



A



B



C

Peddavegi : close view of inscriptions engraved on pranalas, third century AD. See p. 19



Peddavegi : exposed structural remains of temples. *See p. 21*



Banawali : different phases of structural activities, Period IB. *See p. 32*



A



B

Banawali : A, *apsidal structure, Period IC* ; B, *exposed eastern town wall with gate (foreground), streets and residential houses, Period II.* *See p. 33*



A

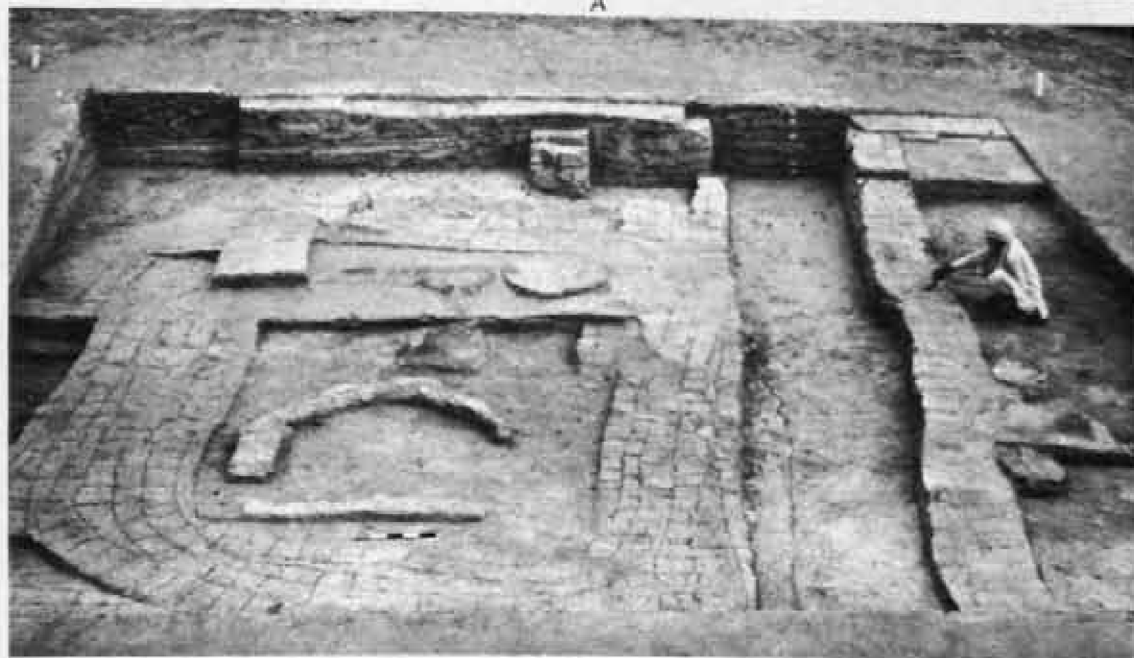


B

Banawali : A, *view of drain from east* ; B, *house-complexes and street, Period II*.
See p. 33

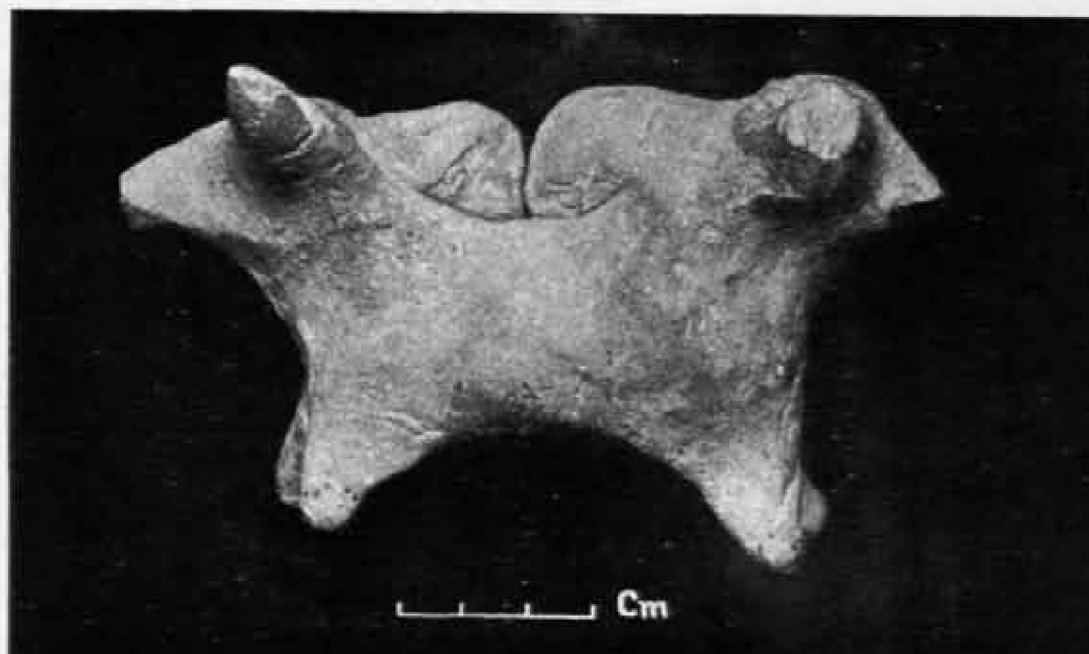


A

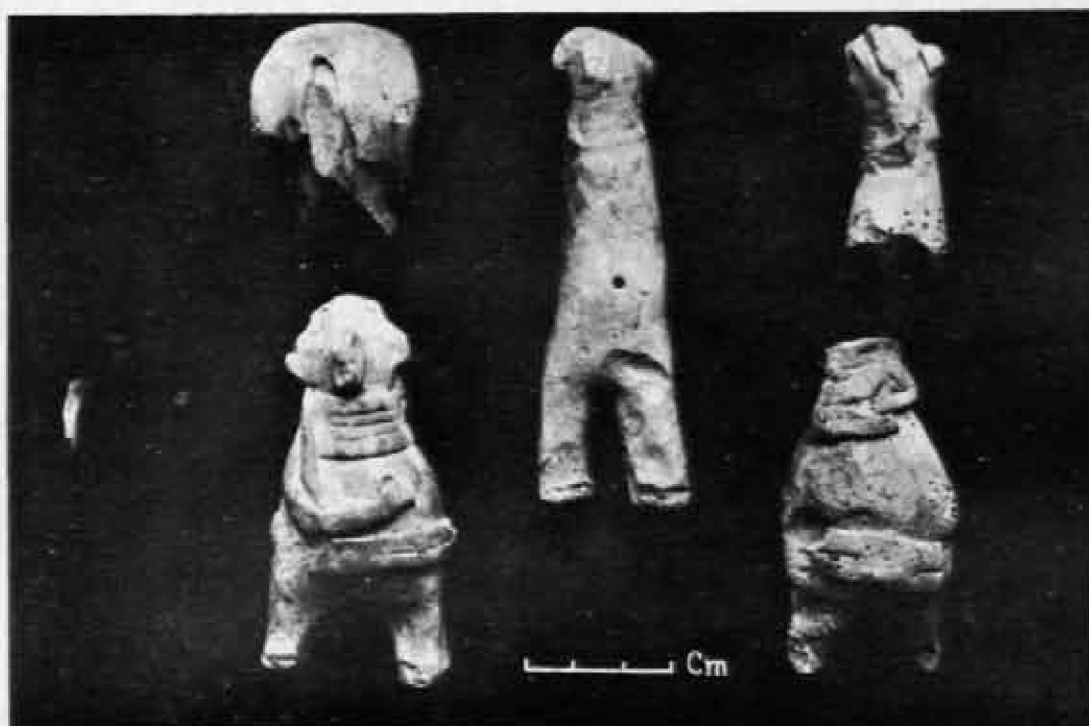


B

Banawali : exposed structures. See p. 33

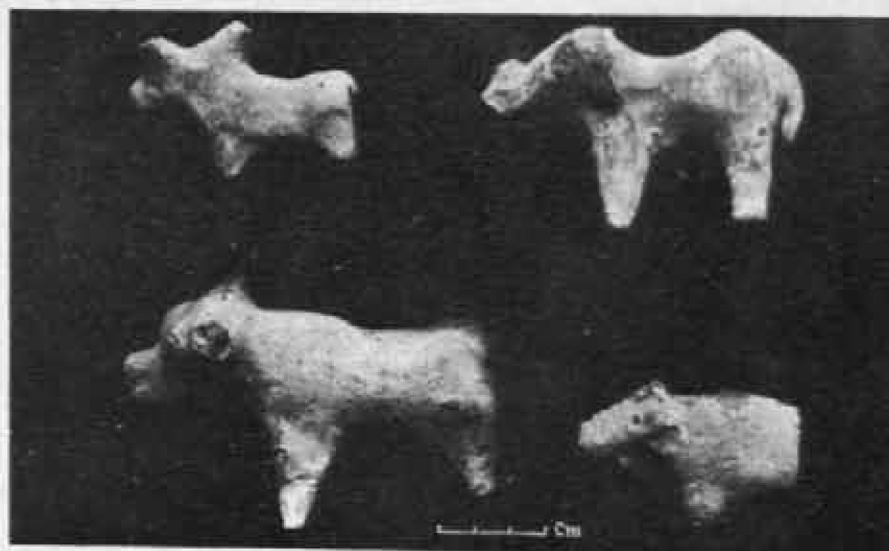


A

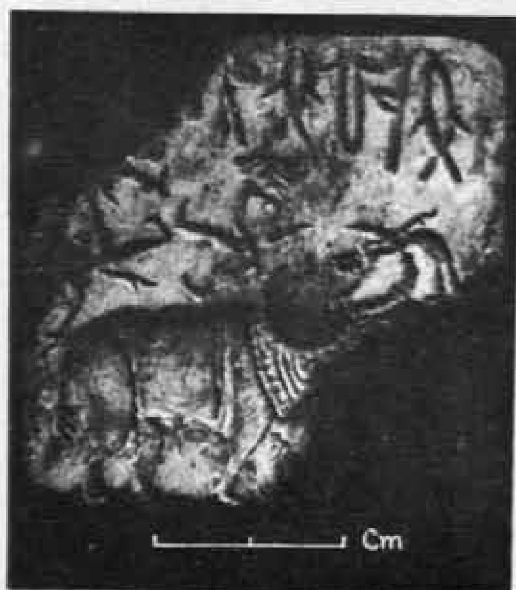


B

Banawali : terracotta, A, *addorsed bull, Period IIB* ; B, *human figurines, Period I. See p. 33*



A

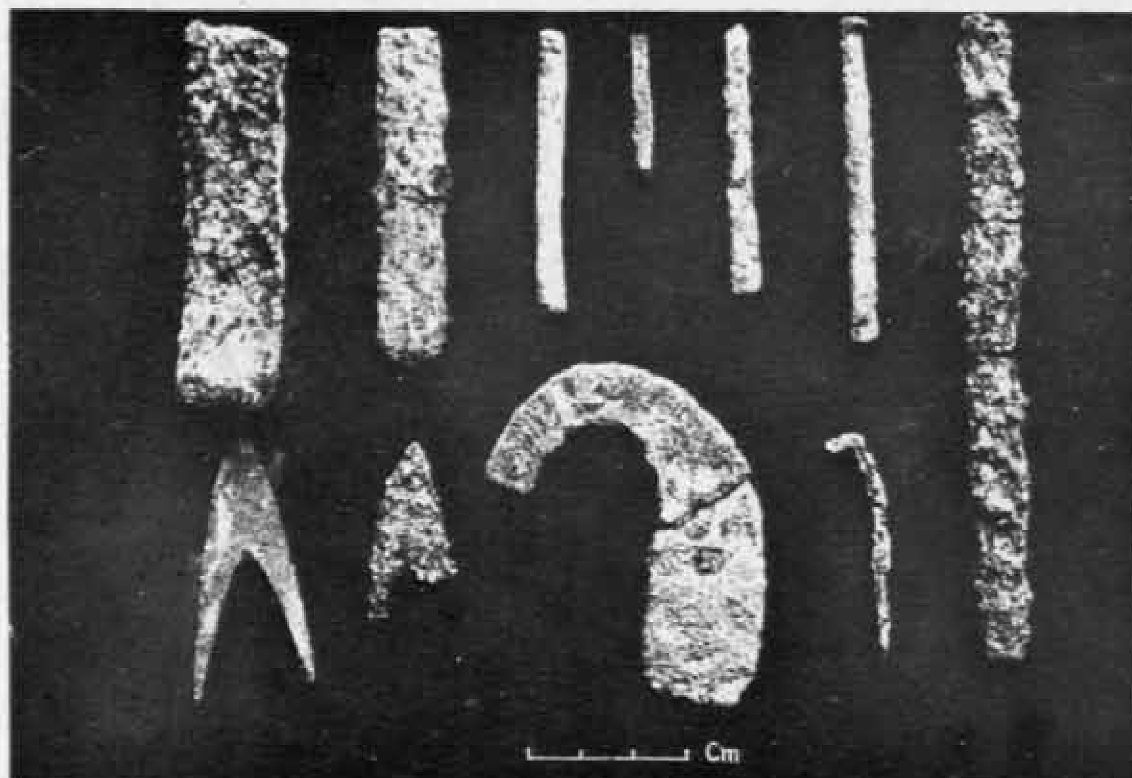


B

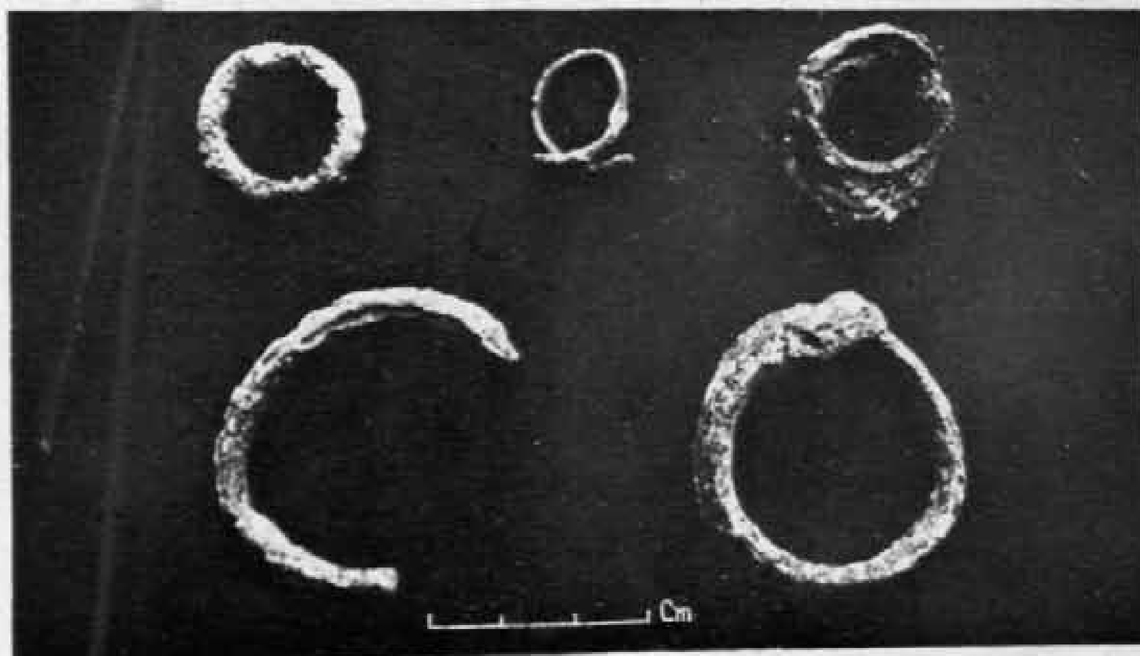


C

Banawali : A, *terracotta animal figurines* ; B and C, *steatite seal and sealing, Period I. See p. 33*



A

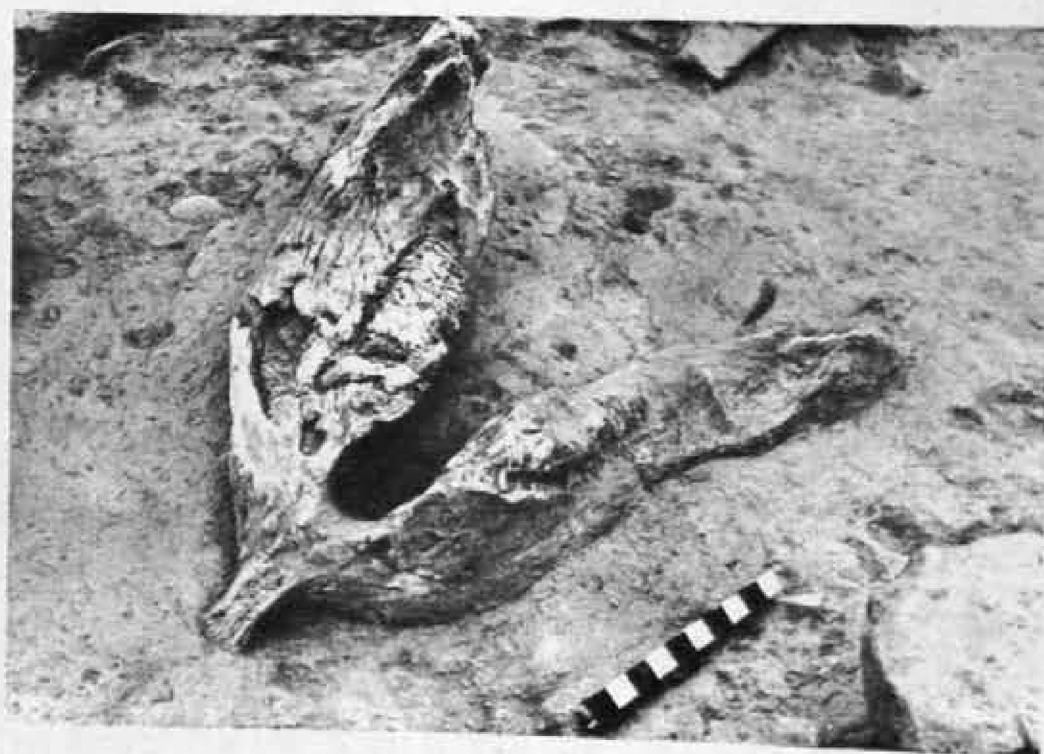


B

Banawali : copper objects. *See p. 34*



B



A

Banawali : A, *mandible of an elephant* ; B, *skull of bull*. *See p. 34*



A



B

Hampi : innermost enclosure wall and structures, A, *during excavation* ;
B, *after resetting. See p. 38*

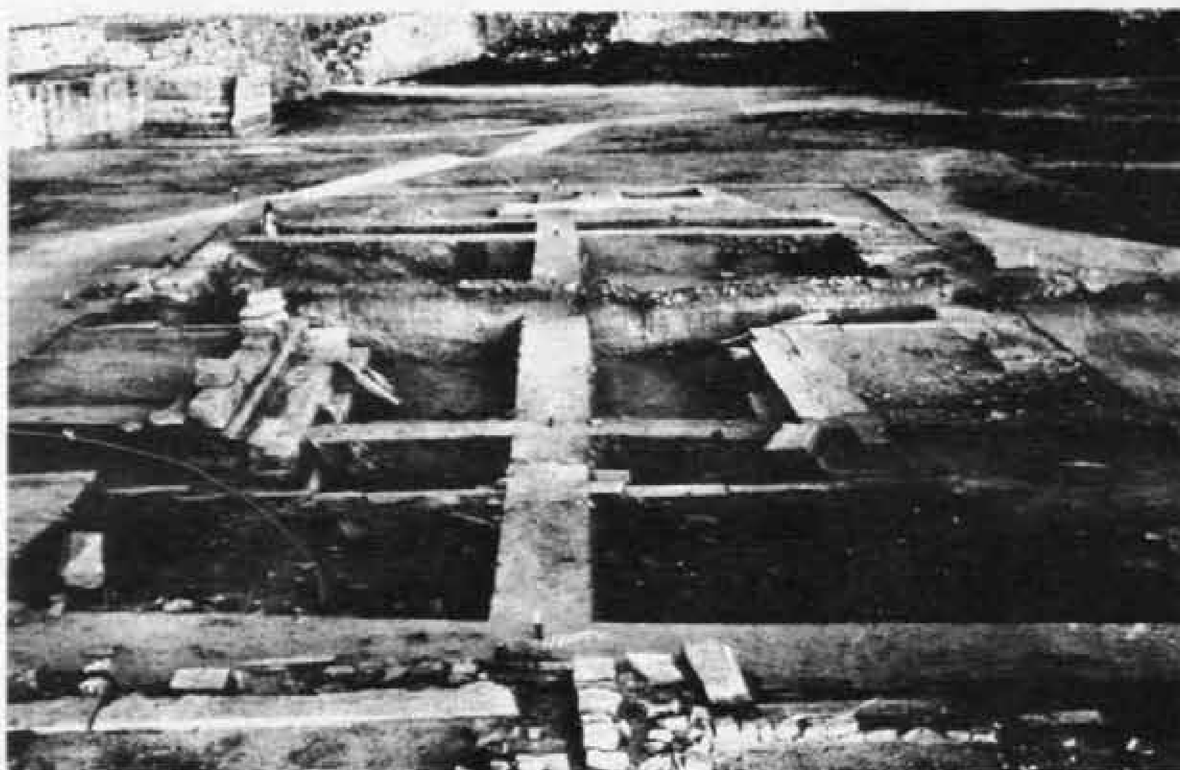


A

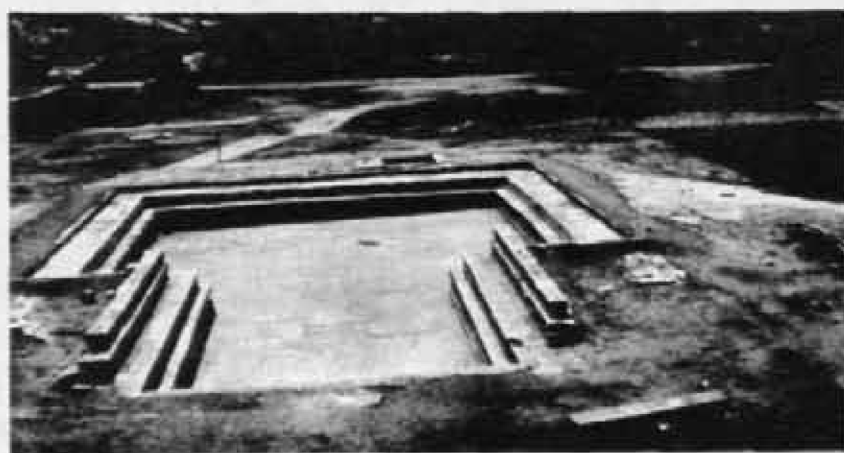


B

Hampi : main drain, A, *during excavation*; B, *after resetting*. *See p. 38*



A



B

Hampi : *T-shaped tank*, A, *during excavation* ; B, *after resetting. See p. 38*



A

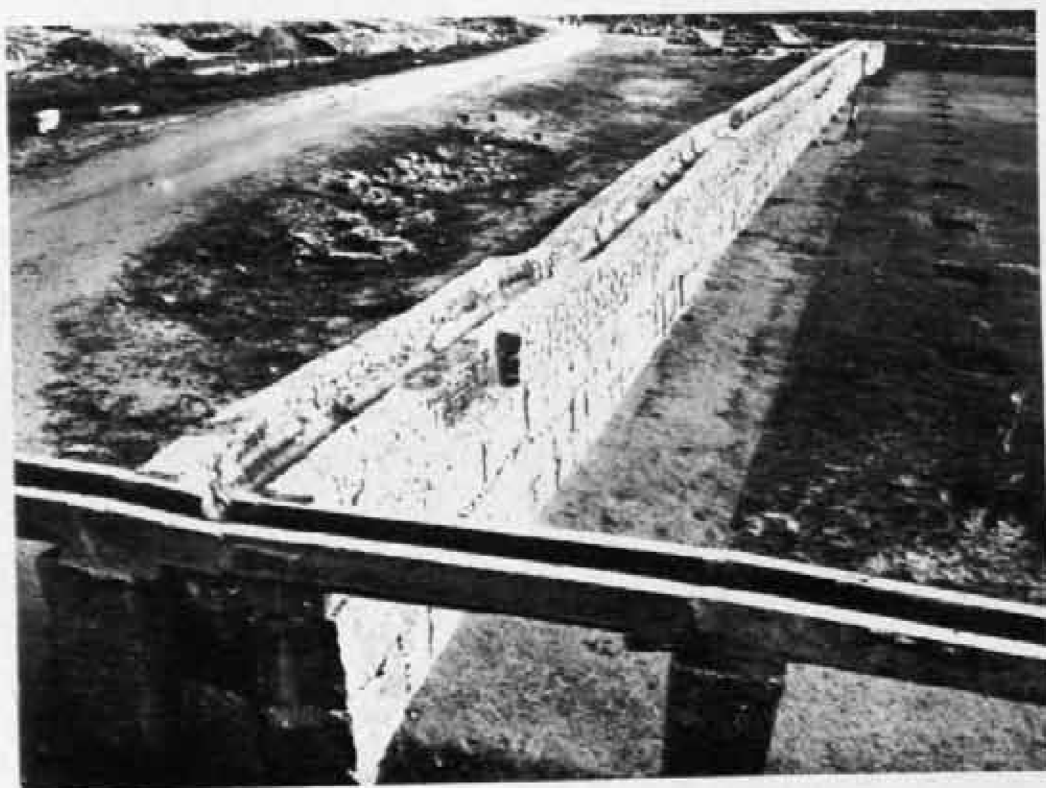


B

Hampi : area north, north-west of Mahanavami-dibba, A, *before excavation ;*
B, *after excavation and resetting. See p. 39*

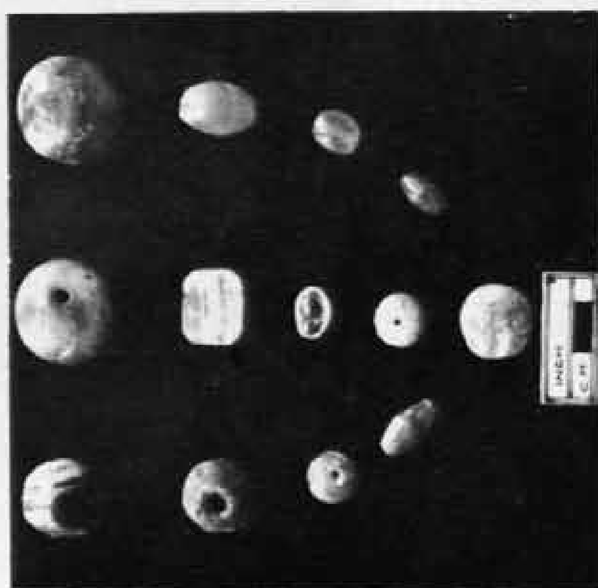


A

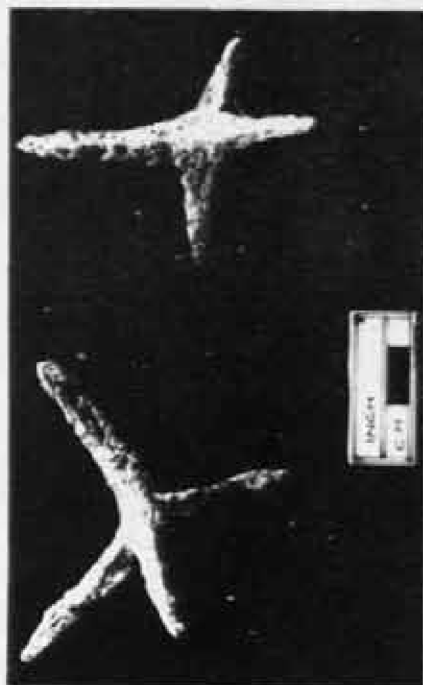


B

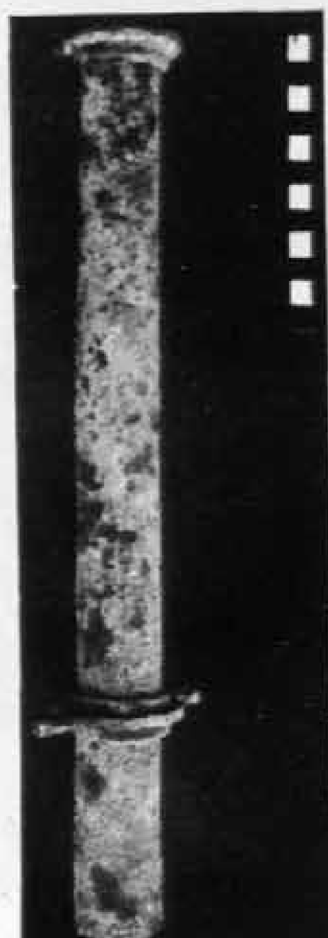
Hampi : *channel connecting main acqueduct and public bath*, A, *during excavation* ;
B, *after resetting. See p. 39*



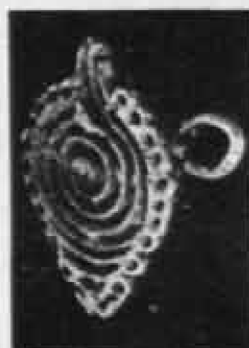
A



B

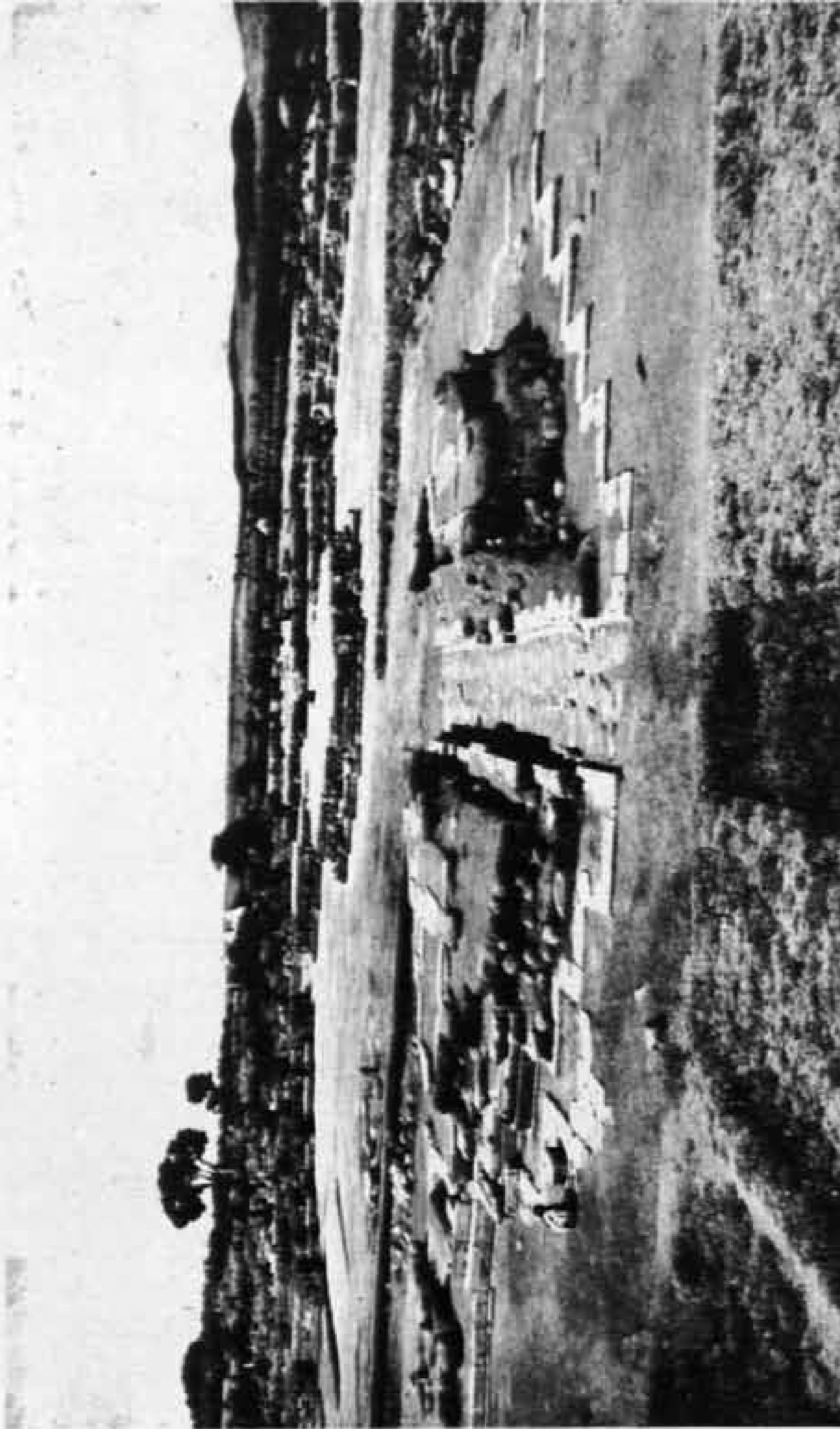


C



D

Hampi : A, *beads of semi-precious stones and terracotta* ; B, *caltrops* ; C, *fragmentary cannon* ; *and* D, *Srivaishnava emblem. See p. 40*



Halebidu : view of exposed mahadvara and temple. *See p. 42*



A



B

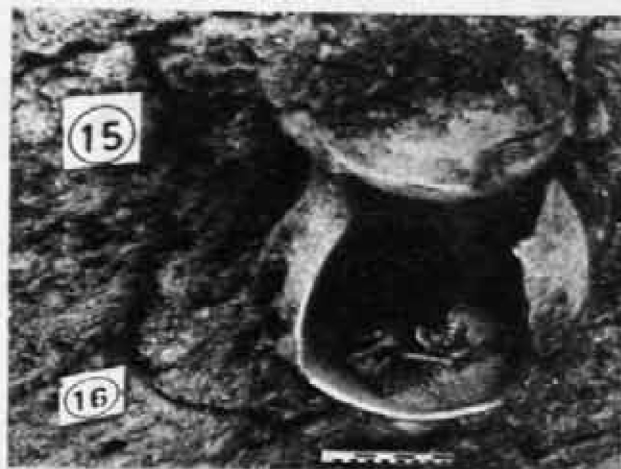


C

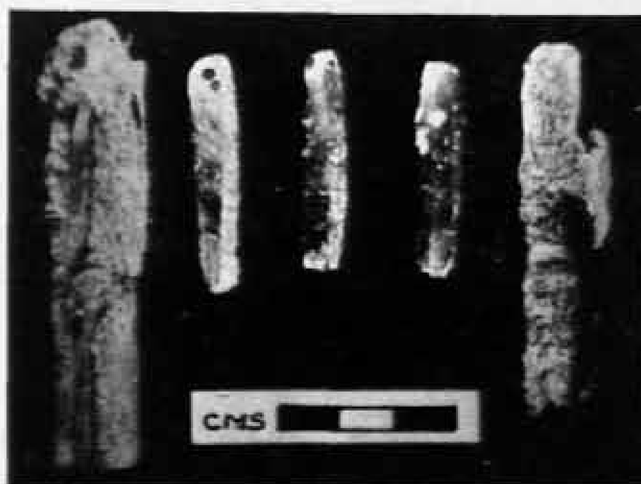
Halebidu : A, *Vishnu in samabhanga*; B, *Siva as Kalari*; and C, *Siva in tribhanga*. *See p. 42*



A



B

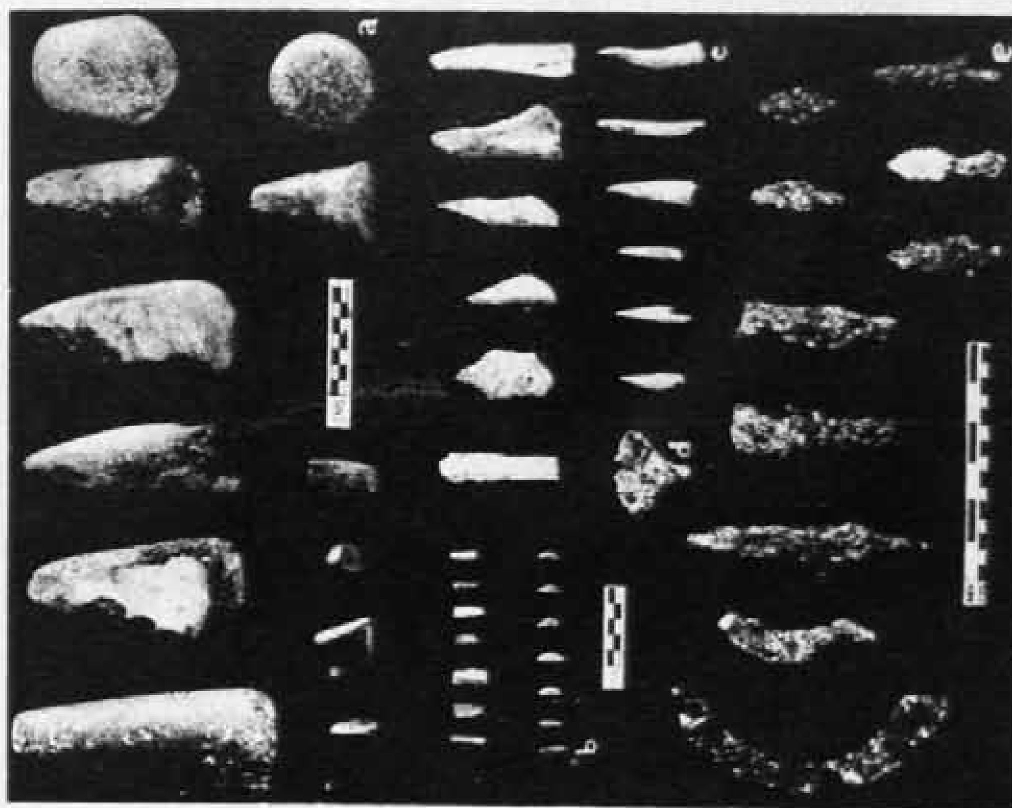


C

Banahalli : A, *pot stand, Period IA* ; B, *vertical urn burial, Period IB* ; C, *fragmentary composite tools, Period II. See pp. 43-45*

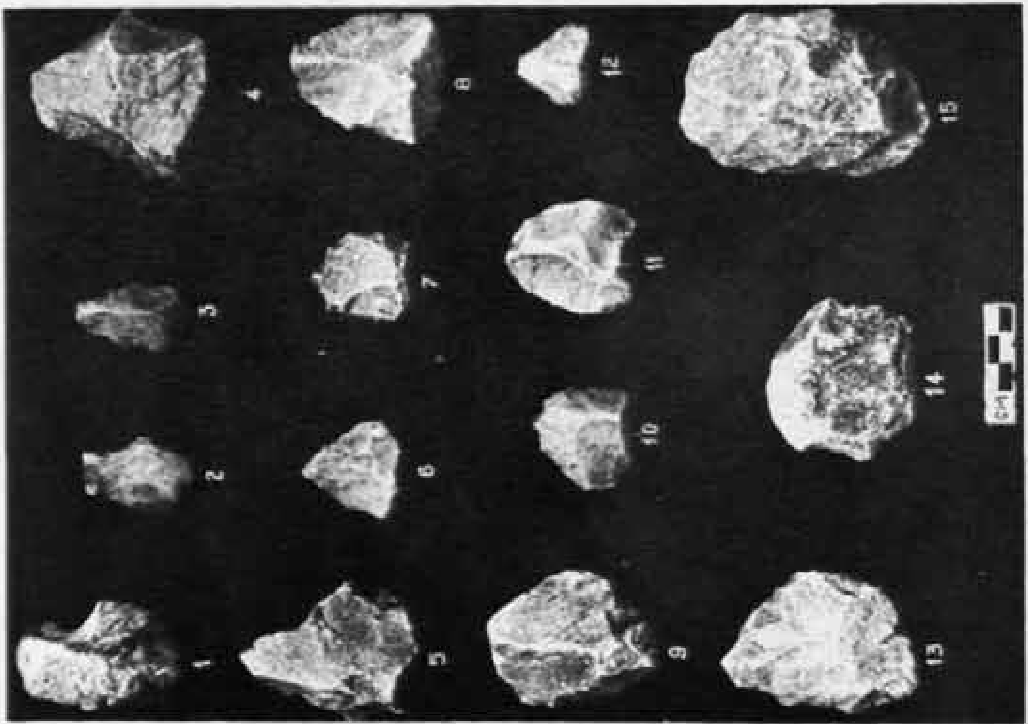


B

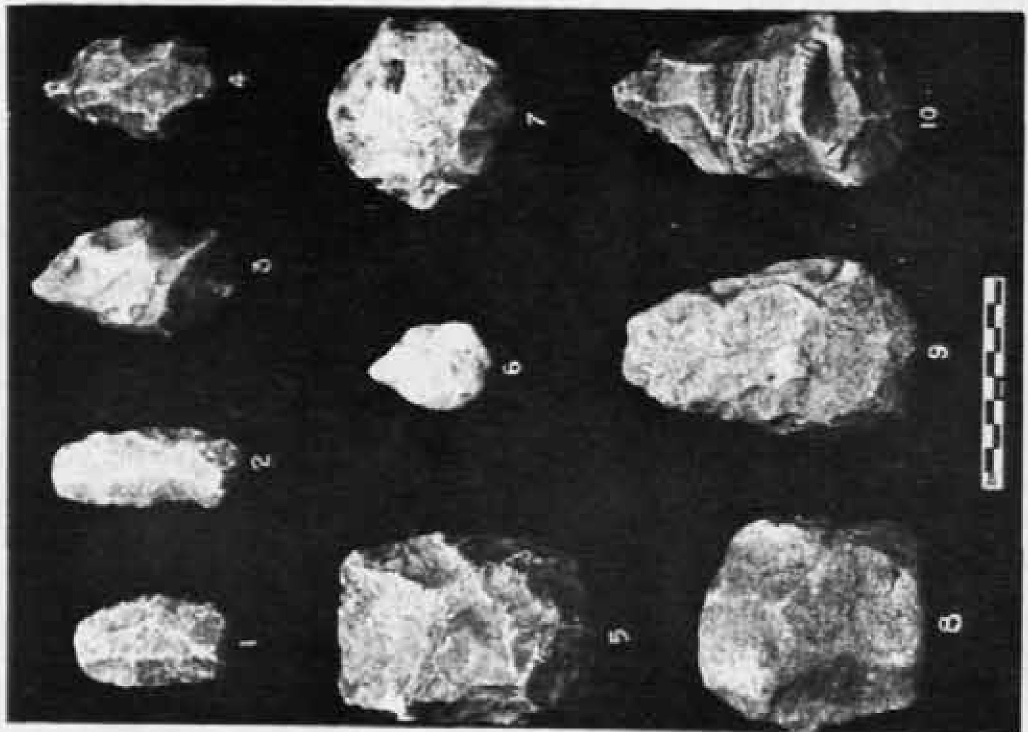


A

Banahalli : A, *artefacts* : B, *extended burials, Period II.* *See pp. 43-45*



B



A

Hirapur Khadan : A, Acheulian and, B, Middle Palaeolithic tools. See p. 55

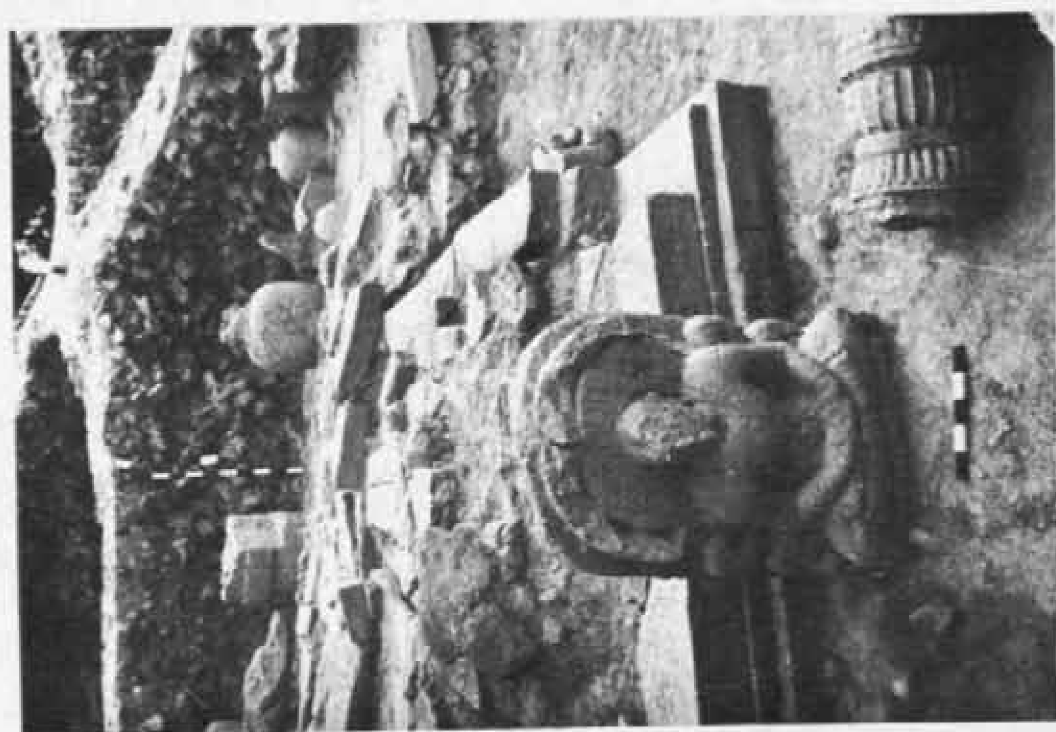


A



B

Lalitagiri : exposed structures and votive stupas. See pp. 64-65



B



A

Lalitagiri : A, *exposed stupa* ; B, *stone pavement. See pp. 64-65*



A



B

Lalitagiri : A, *view of the exposed structures and sculptures* ; B, *inscribed stone pedestal. See p. 65*



A



B

Udaigiri · A, *exposed structures, south face* ; B, *decorated doorjambs and image of Buddha in the centre.* *See p. 67*



A



C



D

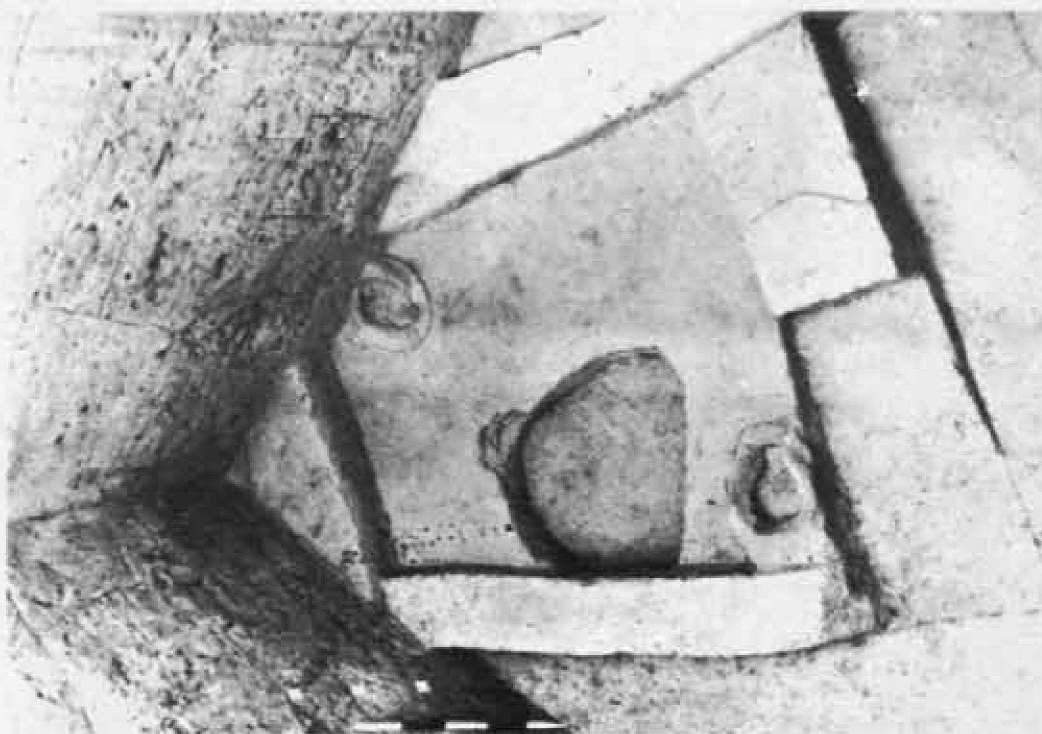


B

Udaigiri : A, *exposed structures, south face* ; B, *decorated doorjambs and image of Buddha in the centre.* *See p. 67*



A

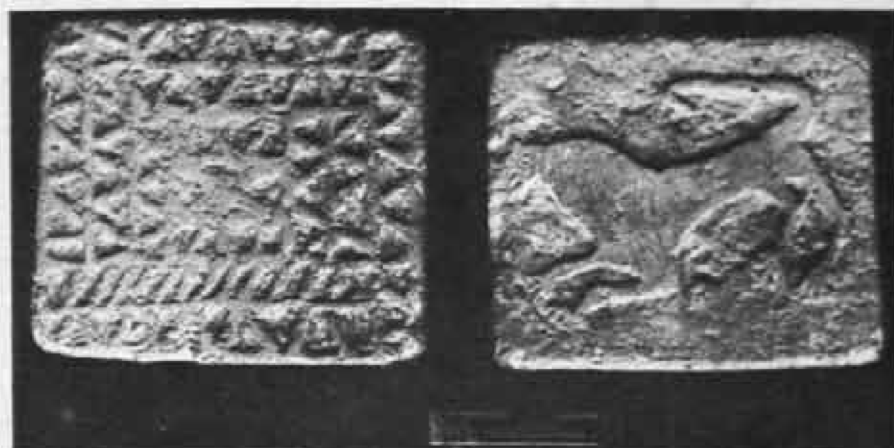


B

Sanghol : A, *close view of rectangular cistern-like structure ;* B, *house plan, late Harappan.* *See p. 70*

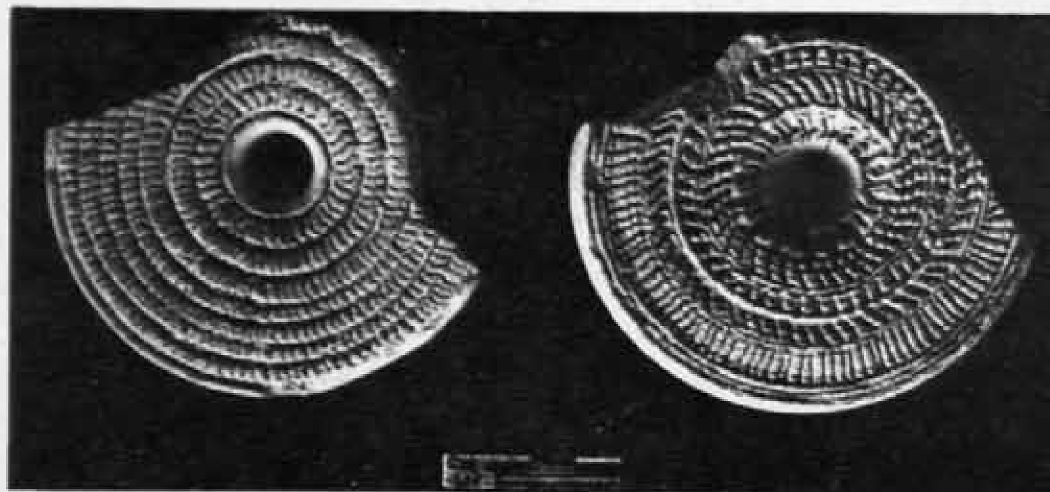


A



B

Sanghol : A, *terracotta human figurines*; B, *disc*. *See p. 71*



A

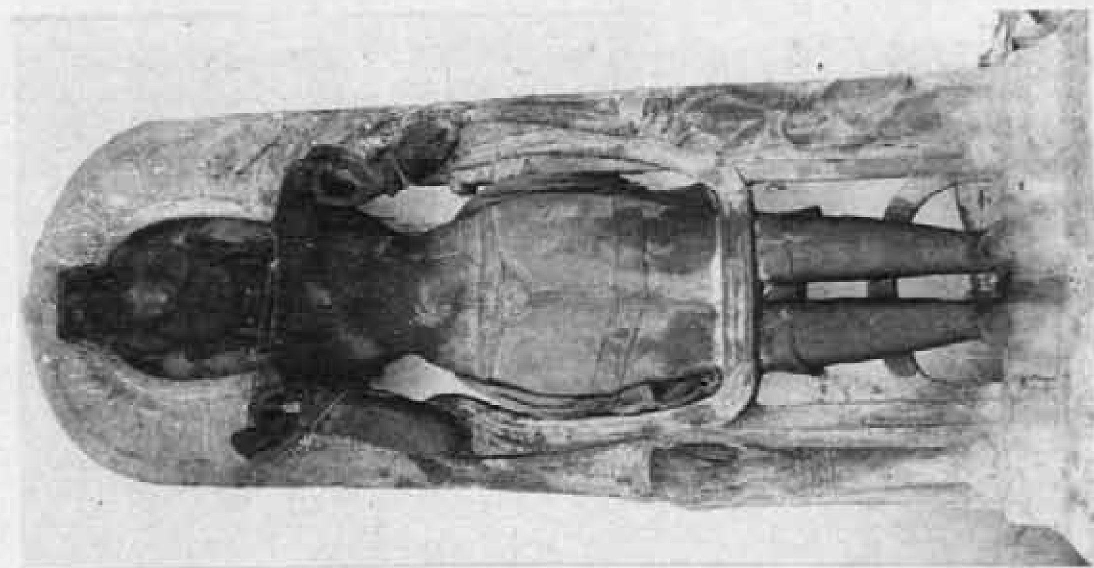


B

Sanghol : A, *terracotta stamp* ; B, *clay tablets. See p. 71*



B

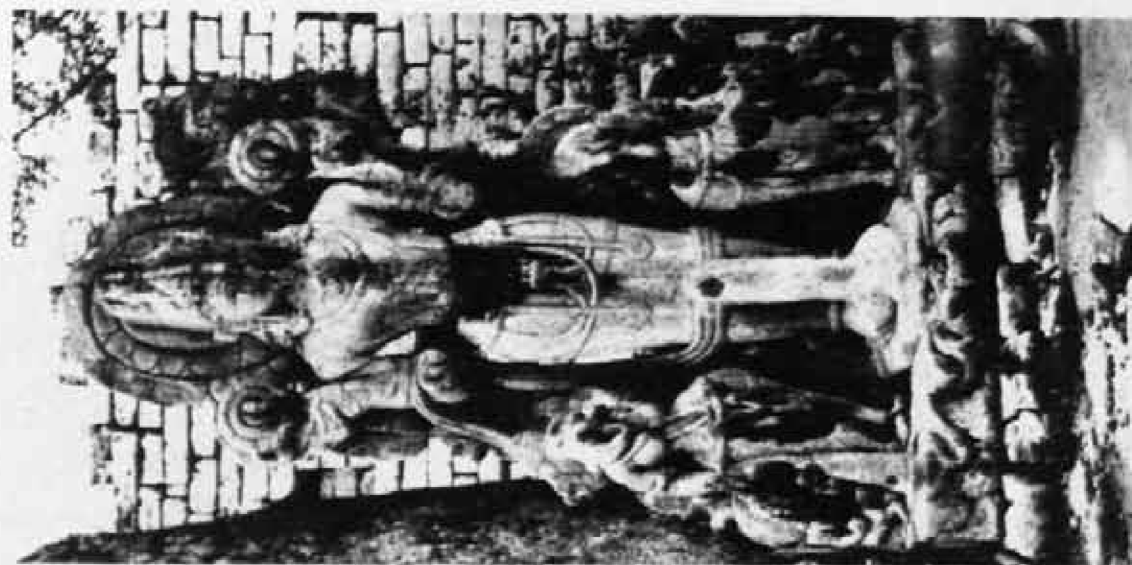


A

Ahiran-ki-Palia : A, image of Surya ; B, Siva and Parvati. *See p. 85*



B



A

A, Kalu Pathak-ka-Purwa : image of Surya ; B, Sanichara : Surya. See pp. 85-86



A



B

A, *Sanichara : image of Vishnu, Siva (?) and Surya* ; B, *Somnabhar : stone panel representing Revanta.* *See pp. 86-87*



Singur : inscription of Chalukya Bhuvanaikamalla. See p. 104

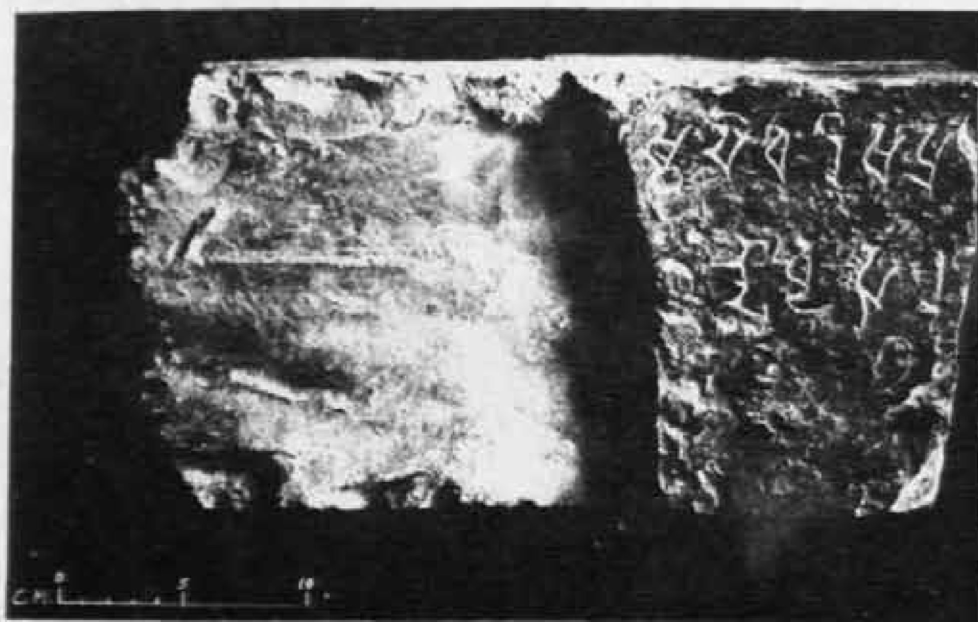
A

B

A, *Bhir : Mughal inscription* ; B, *Sholapur : bilingual inscription.* *See pp. 113-114*



A



B

Naranag : A, *head of Siva* ; B, *stone slab inscription.* *See p. 118*

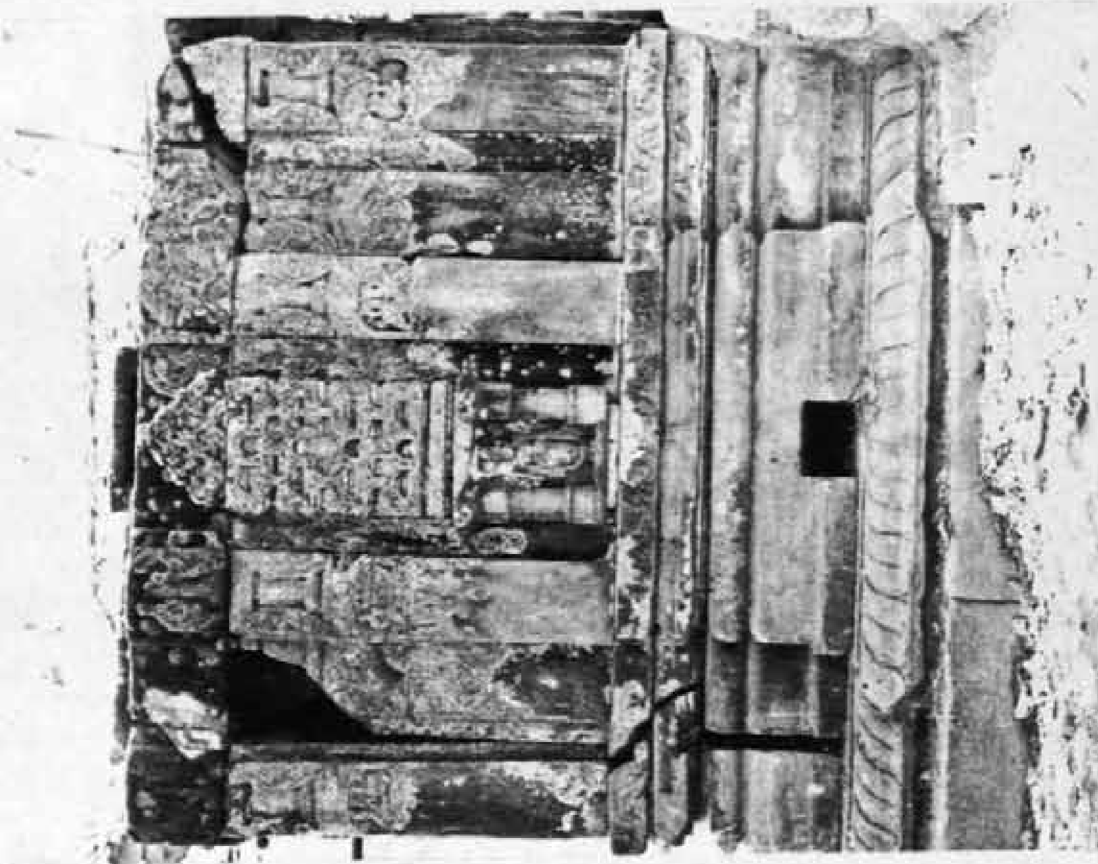


B



A

A, *Tala : Image of Naigamesha* ; B, *Badok-Pathari : Buddha in bhumisparsamudra. See pp. 118 and 120*

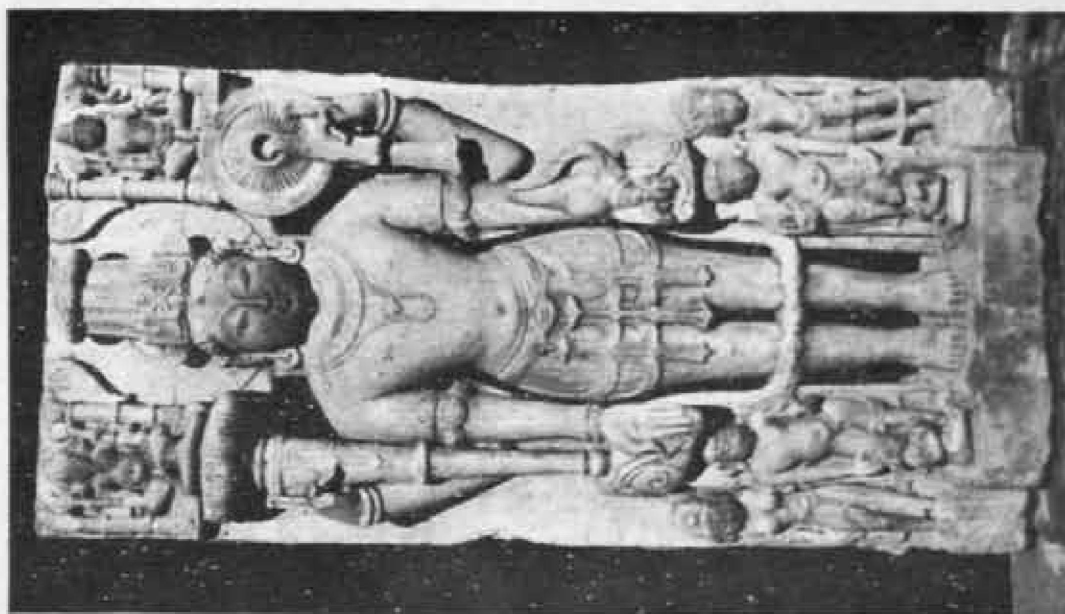


A



B

A, Sherwāsa : Siva temple, view from north ; B, Melpadi : image of Siva. See pp. 120 and 122

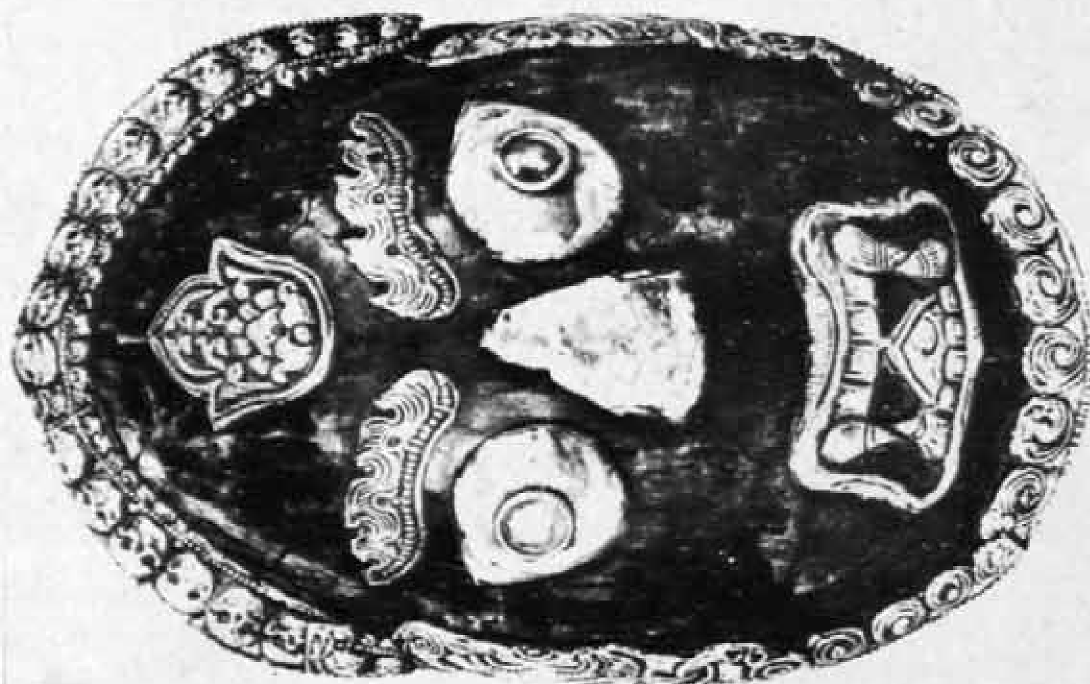


B

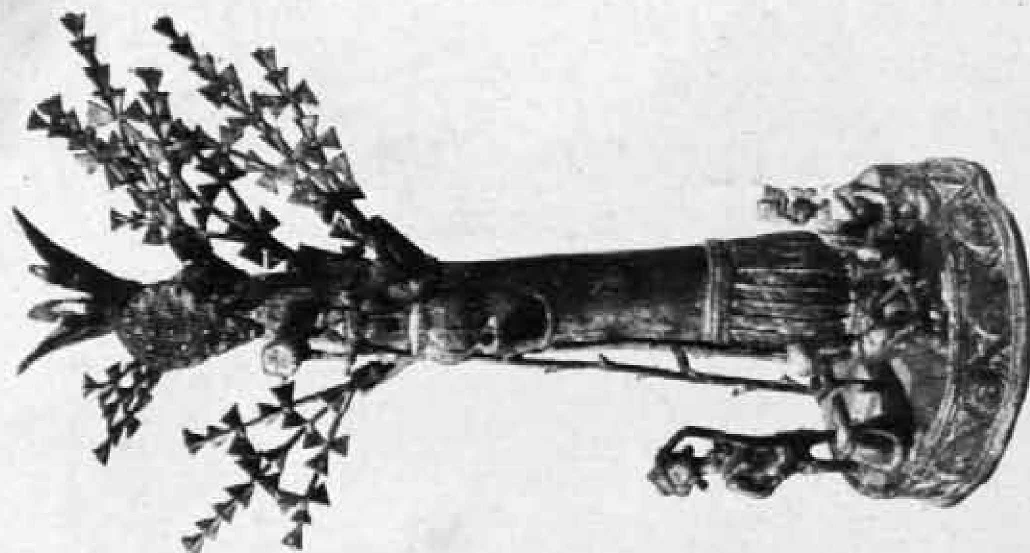


A

Government Museum, Mathura : A, *bust of Surya* ; B, *four-armed Vishnu. See p. 135*



B



A

National Museum, New Delhi : A, folk deity from Bastar ; B, skull mask from Tibet. *See p. 135*



A

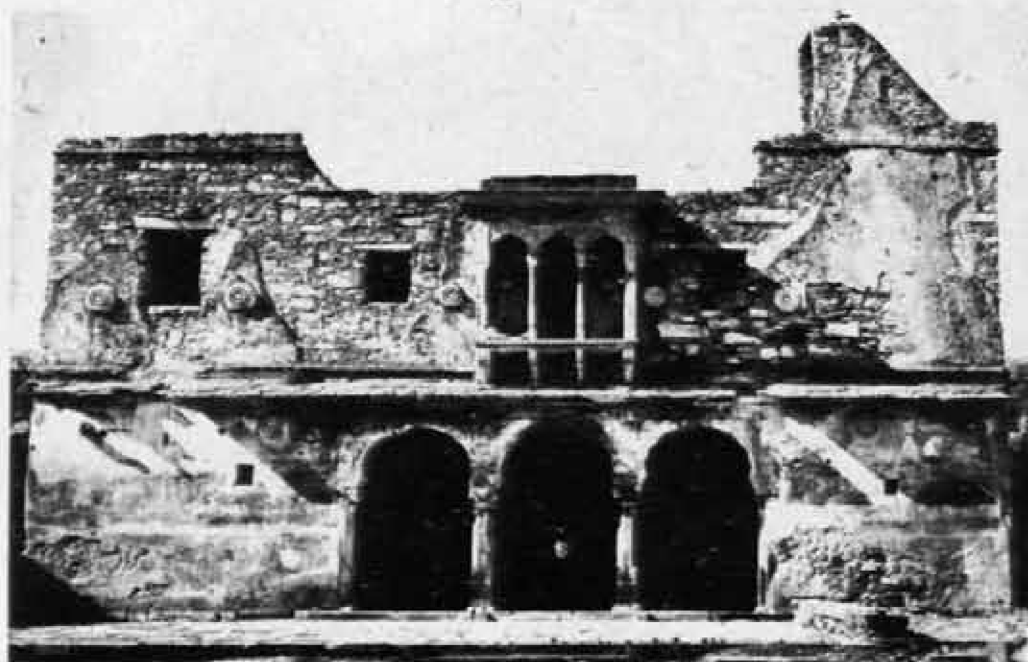


B

A, *Jiran : Siva temple, view from north-west* ; B, *Barukheda : Siva temple, view from north-west.* *See p. 137*



A

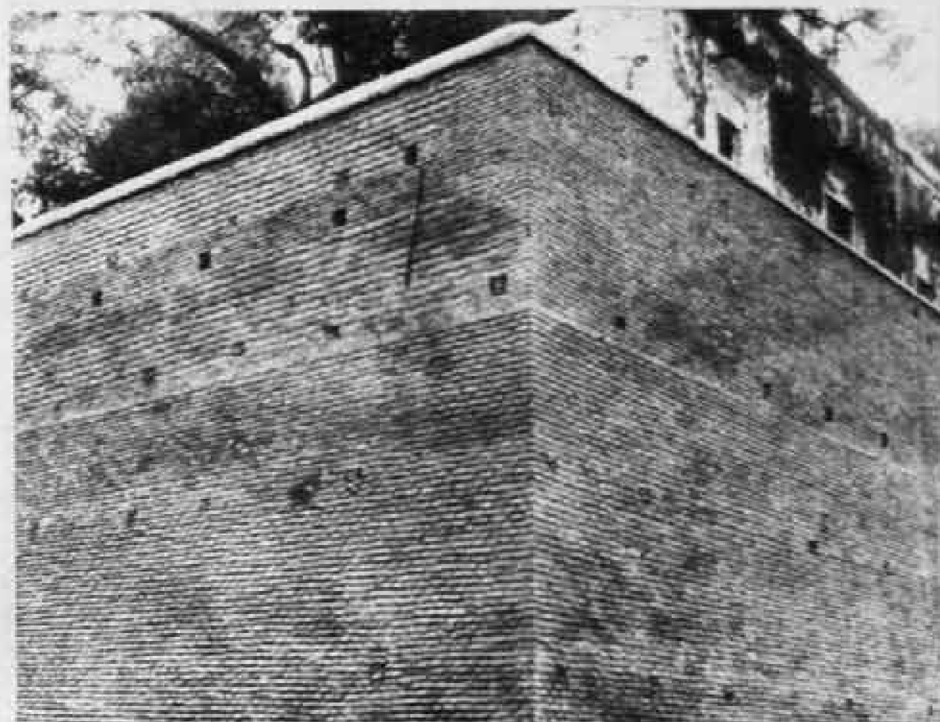


B

Ranthambhor Fort : A, *gateway of Rani Mahal and* B, *view of Pachauri Mahal. See p. 139*

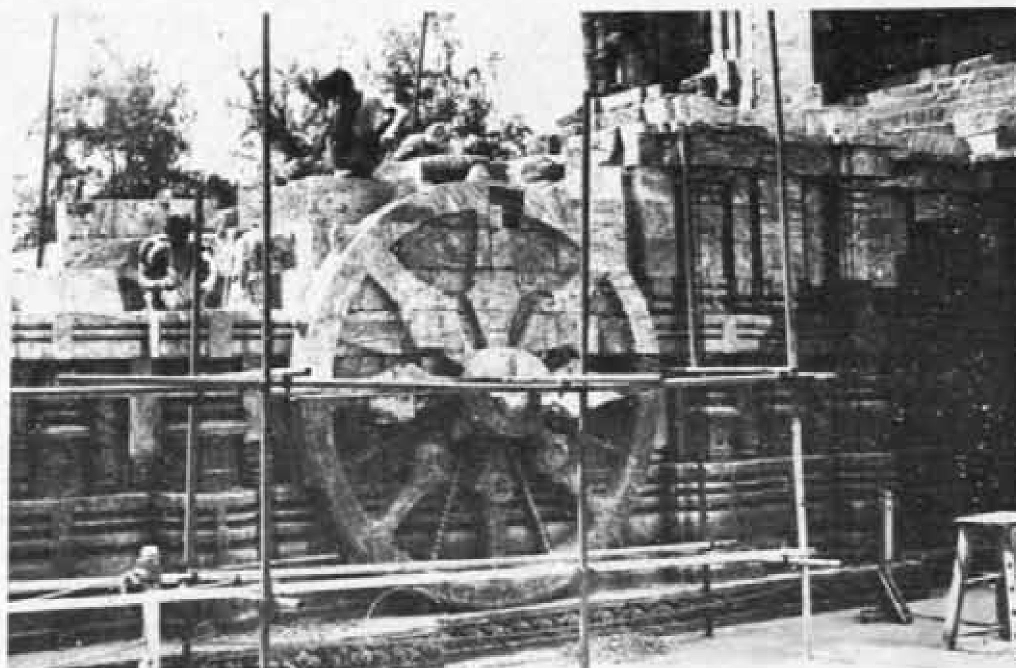


A



B

Madan Mohan temple, Brindaban : A, *before, and* B, *after conservation.* *See p. 143*



A

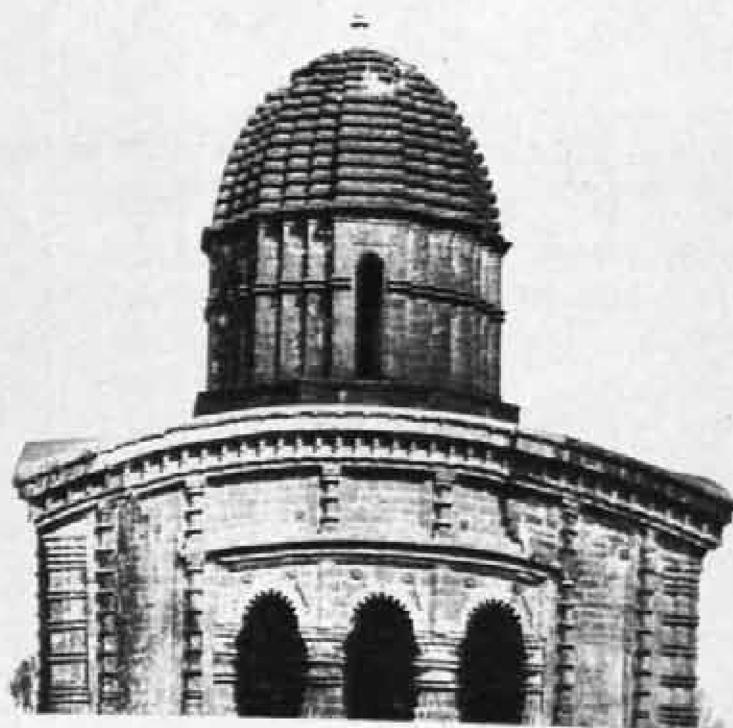


B

Sun Temple, Konarak : A, *before*, and B, *after conservation. See p. 150*



A



B

Nand Lala Temple, Bishnupur : A, *before*, and B, *after conservation. See p. 151*

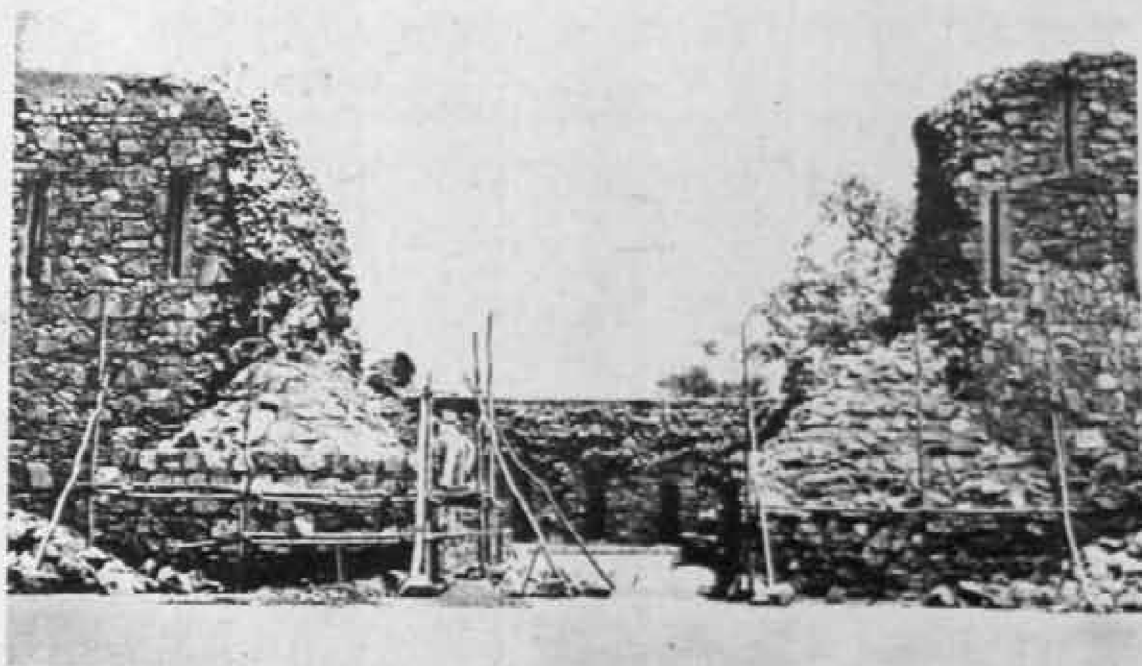


A

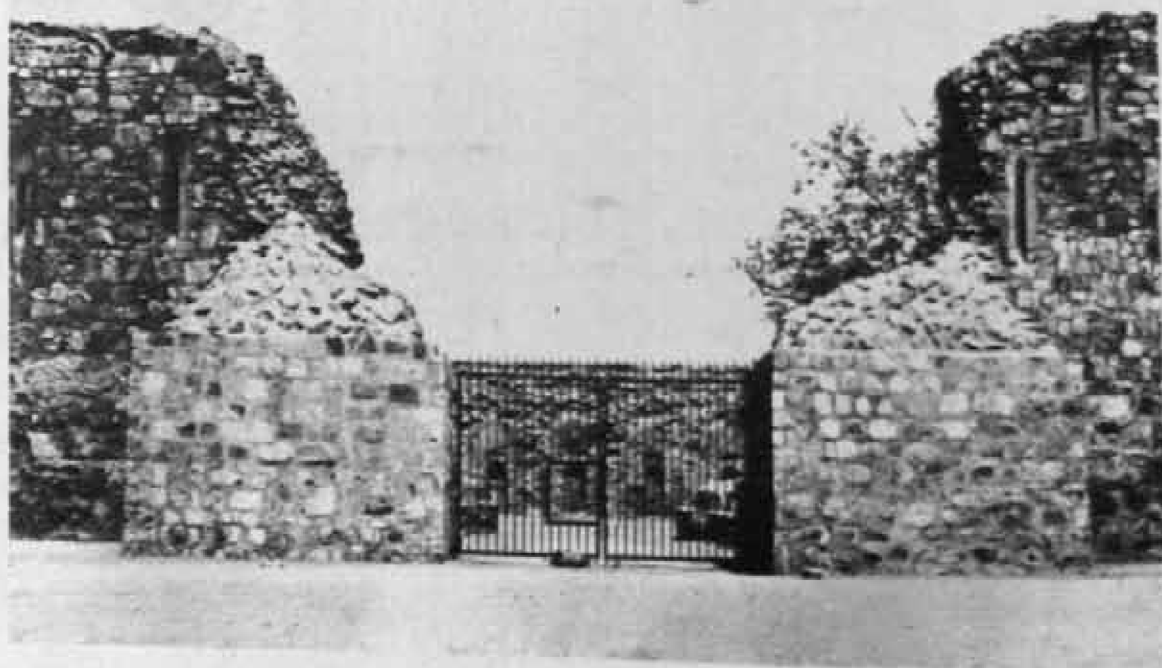


B

Radha-Madhaba temple, Bishnupur : A, *before, and* B, *after conservation. See p. 151*

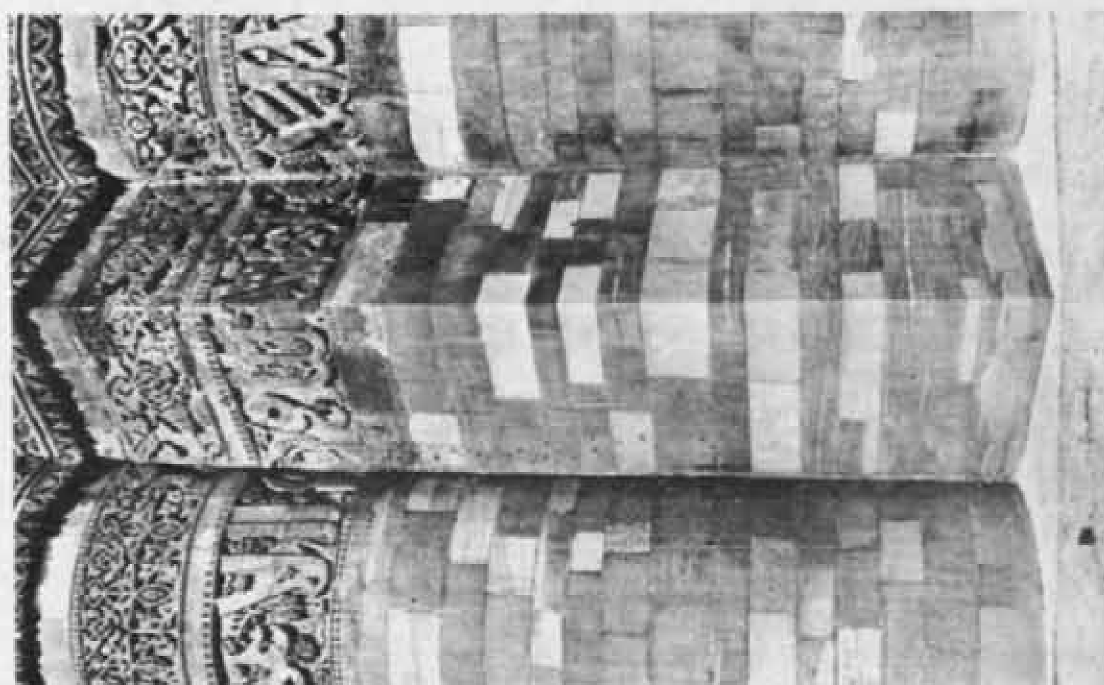


A



B

Kotla Firuzshah, Delhi : *gateway*, A, *before*, *and* B, *after conservation*. *See p. 154*



B

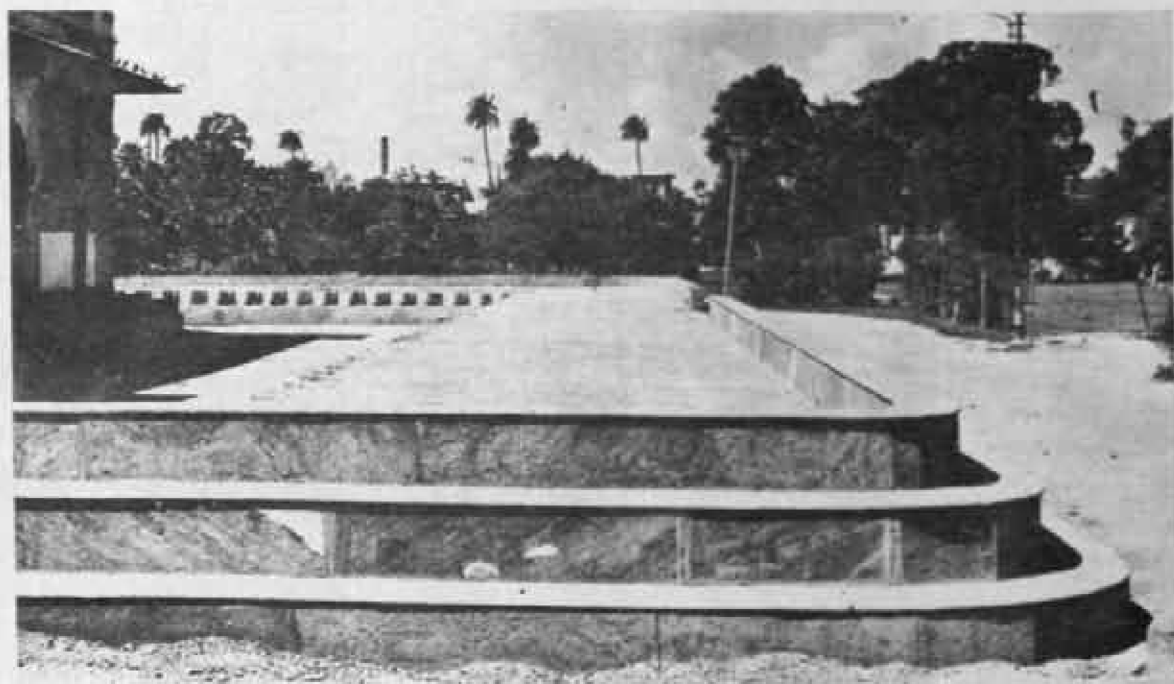


A

Qutb Minar, New Delhi: veneer-work, A, during, and B, after repairs. *See p. 154*



A



B

Raushanara Baradari, Delhi : terrace work, A, *before*, *and* B, *after conservation. See p. 154*



A



B

Fort, Chittaurgarh: Asvashala, Rana-kumbha's palace, A, *before*, and B, *after conservation.*
See p. 160



A



B

Fort, Jaisalmer : fortification wall, A, *before, and* B, *after reconstruction. See p. 160*

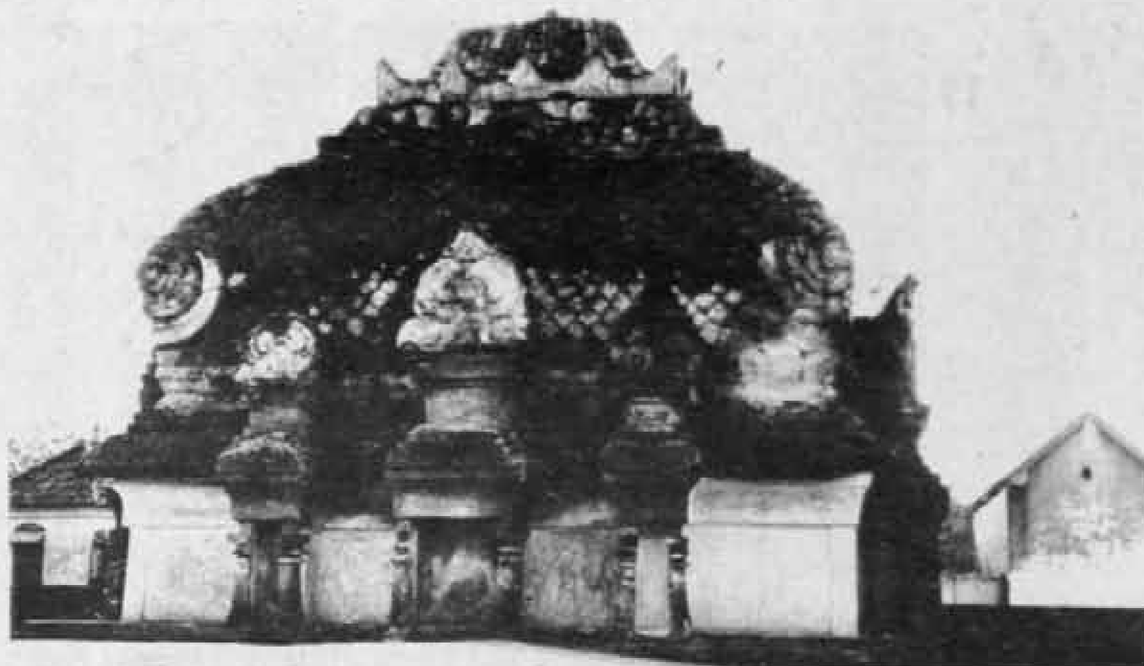


A

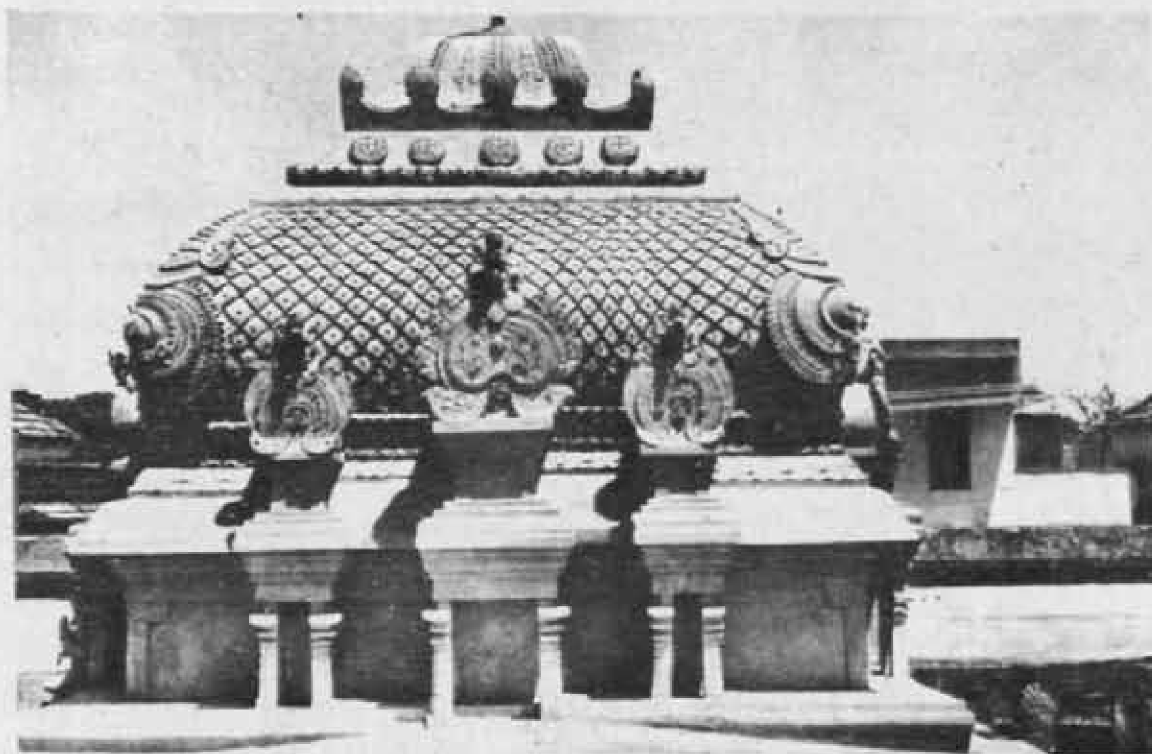


B

Fort, Ranthambhor : Hammir palace, A, before, and B, after conservation. *See p. 160*

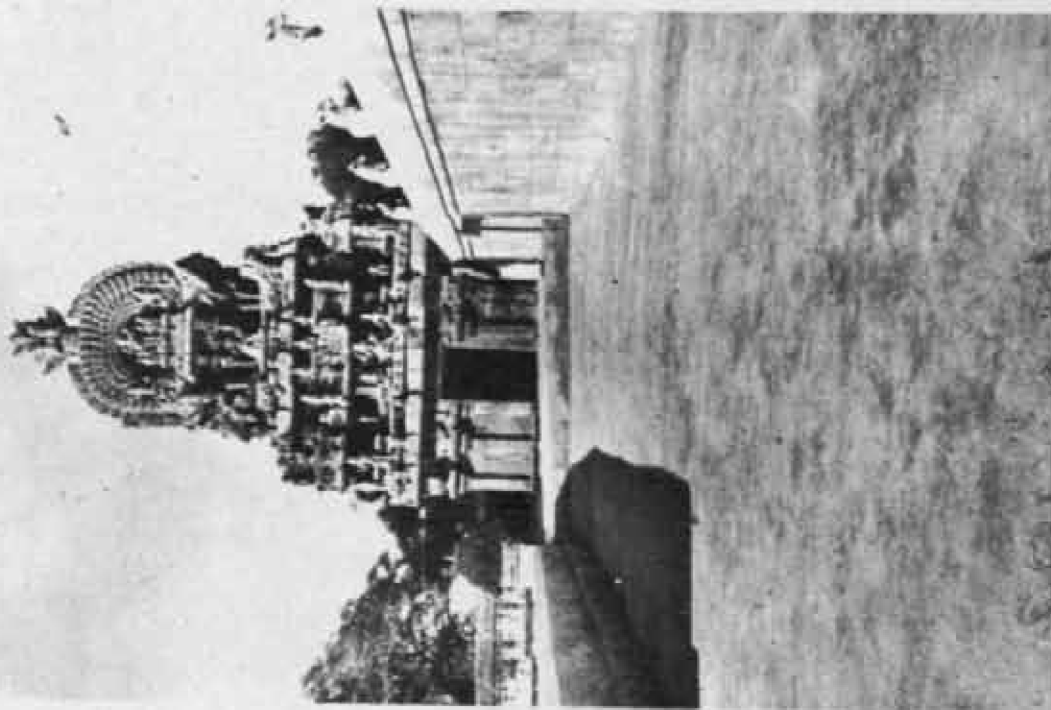


A



B

Rajendracholesvara Temple, Ponnamaravathy : vimana, A, before, and B, after conservation.
See p. 163



B



A

Airavatesvara temple, Darasuram : terrace over mandapa, A, before, and B, after conservation. See p. 164

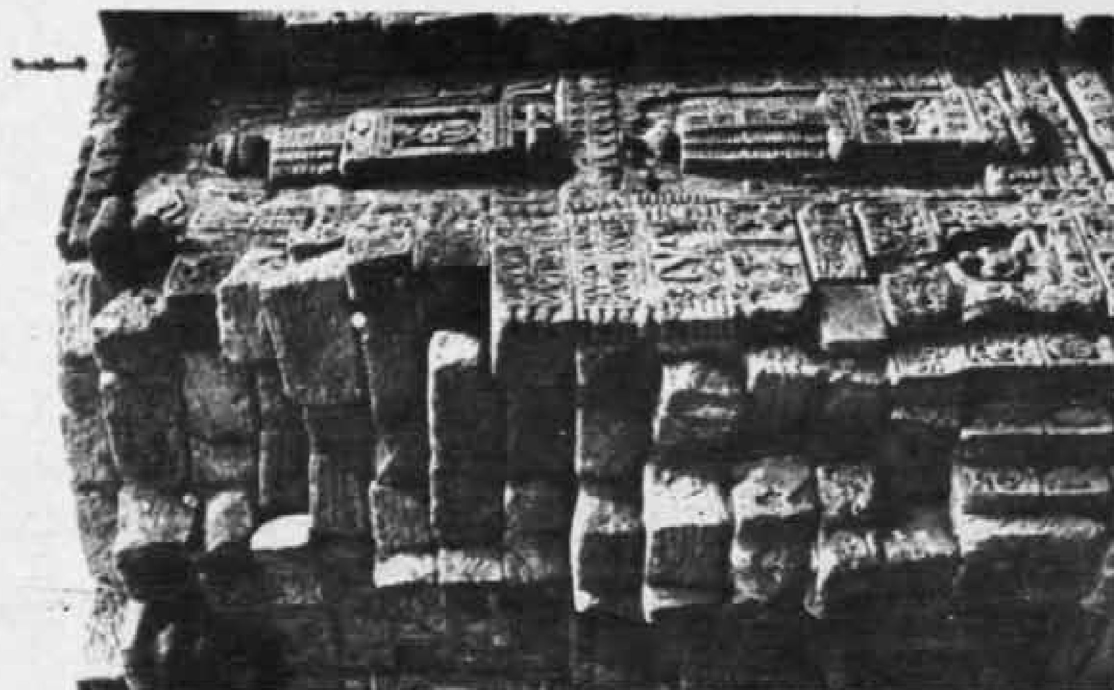


A



B

Ardhanarisvara temple, Mandi : wall of mandapa, A, before, and B, after conservation. *See p. 166*



B



A

Ardhanarisvara temple, Mandi : wall of mandapa. A, before, and B, after conservation. *See p. 166*



B



A

Trilokinath temple, Mandi : retaining wall, A, during, and B, after reconstruction. *See p. 166*

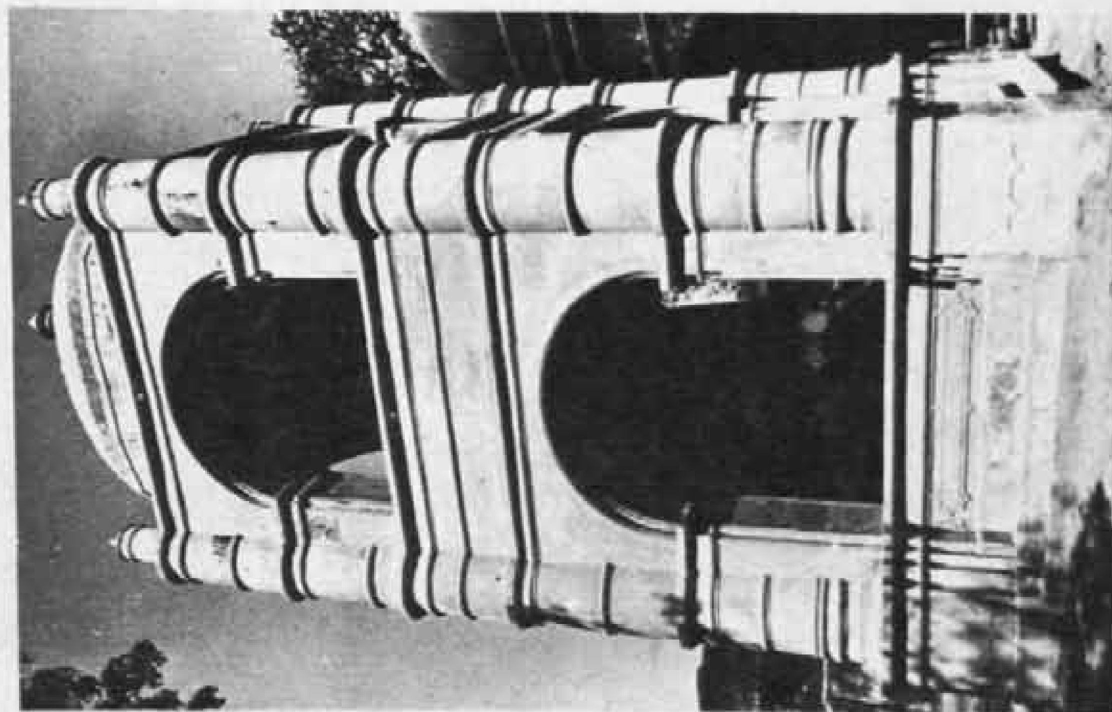


A

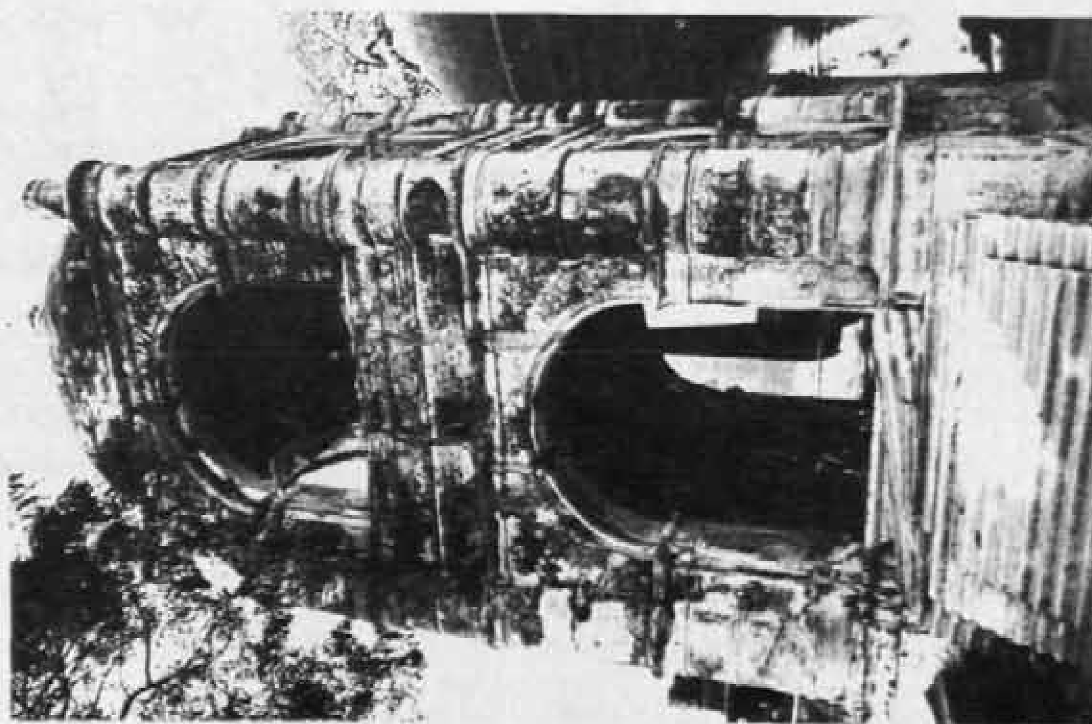


B

Sun temple, Modhera : nritya mandapa, A, *before ,and* B, *after conservation.*
See p. 171

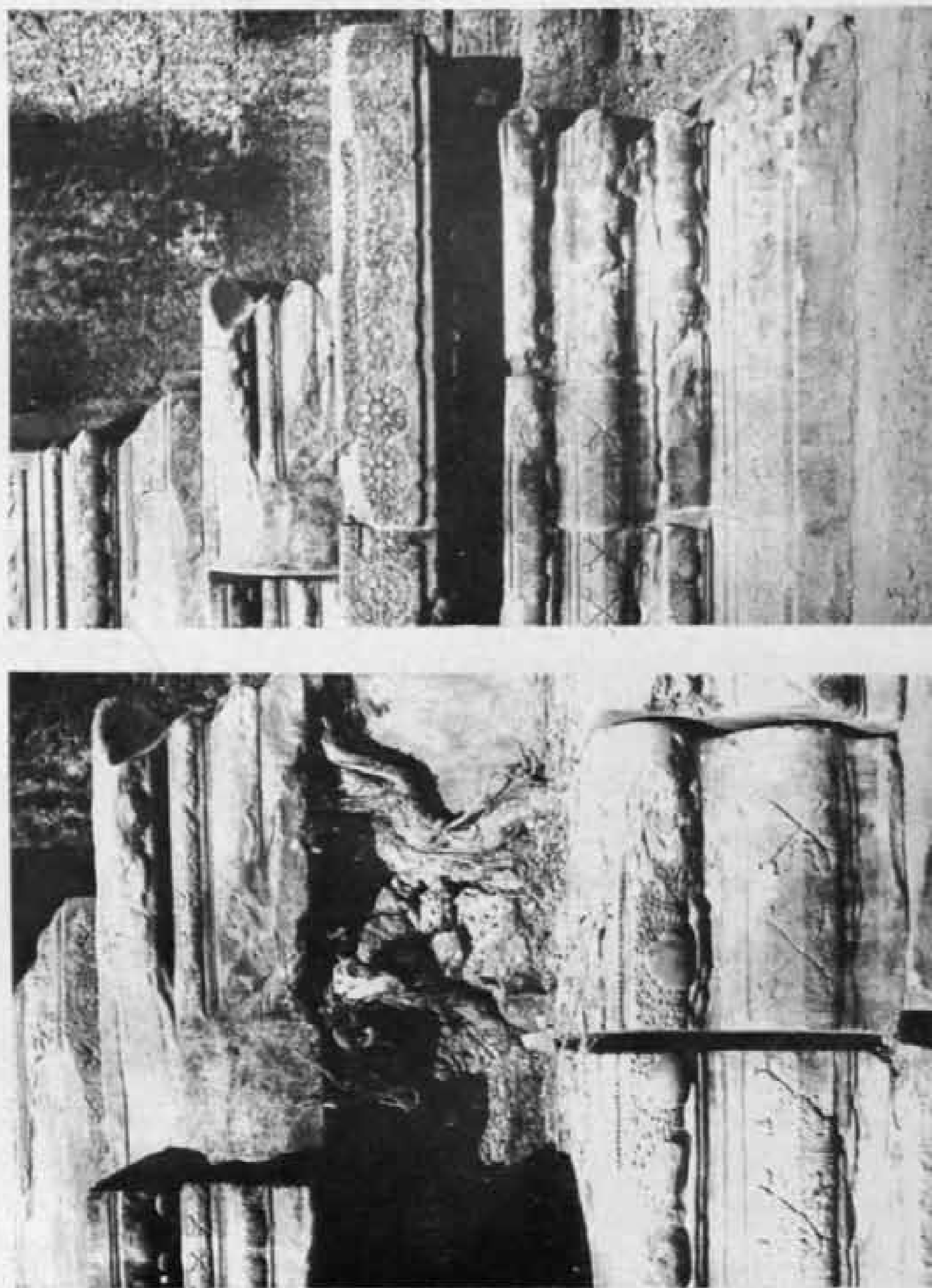


B



A

Old Dutch and English tombs, Surat : A, *before*, *and* B, *after conservation.* *See p. 172*



Angkor Vat Temple, Siemreap (Cambodia): moulded plinth, fourth enclosure, A, before, and B, after conservation. *See p. 178*

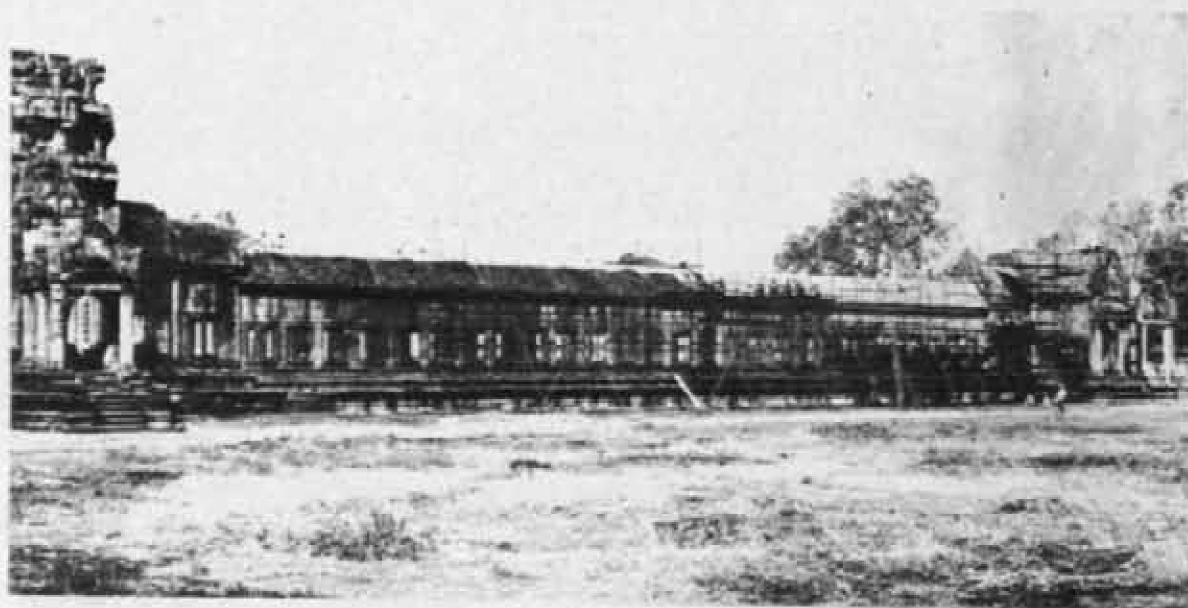


B

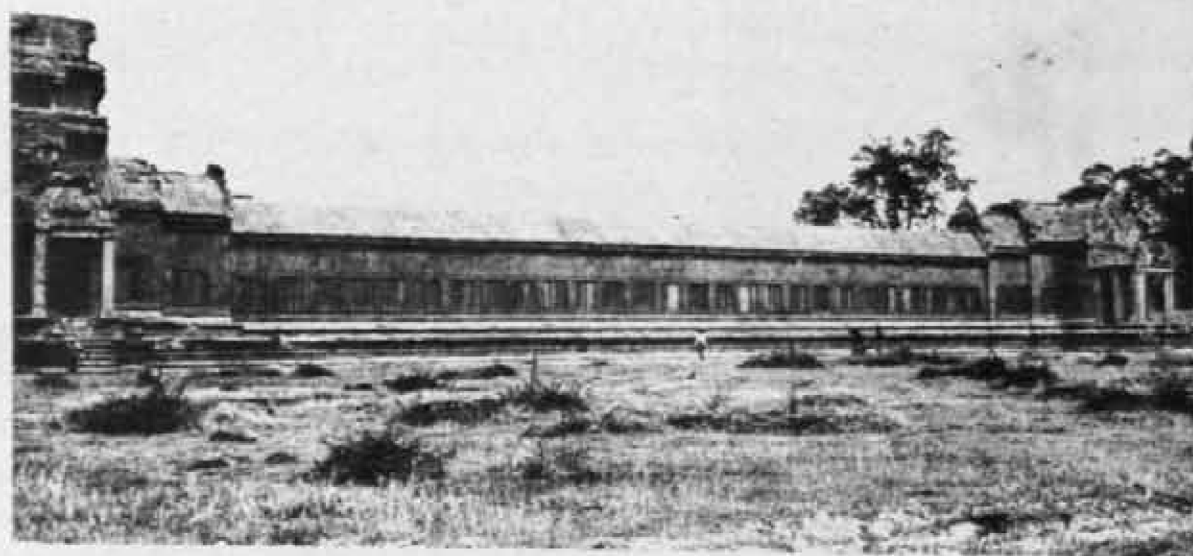


A

Angkor Vat Temple, Siemreap (Cambodia) : apsara figure. A, before, and B, after conservation. *See p. 178*

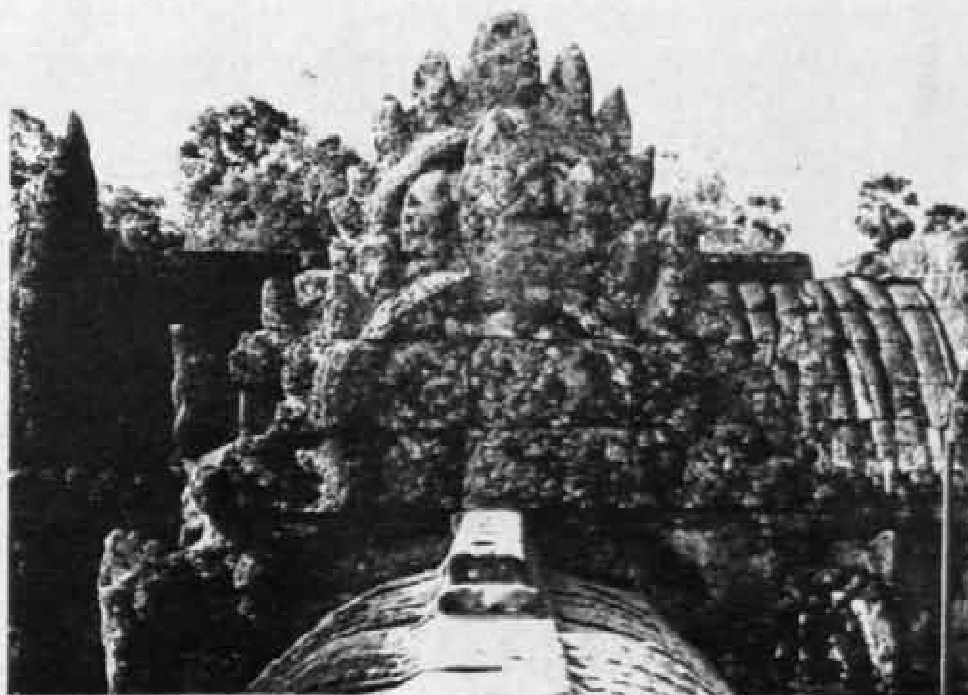


A



B

Angkor Vat Temple, Siemreap (Cambodia) : pediment, western gate, A, *before, and* B, *after treatment. See p. 178*



A



B

Angkor Vat Temple, Siemreap (Cambodia) : pediment, western gate, A, before, and B, after treatment. *See p. 178*



B



A

Angkor Vat Temple, Siemreap (Cambodia) : apsara figures. A, before, and B, after conservation. *See p. 178*



B



A

Buddhist Monasteries, Tabo : paintings. A, before, and B, after treatment. *See p. 180*



B



A

Buddhist Monasteries, Tabo : paintings, A, before, and B, after treatment. *See pp. 180-181*



B



A

Archaeological Museum, Hazarduari Palace, Murshidabad : canvas paintings. A, before, and B, after treatment. See p. 186



A



B

Archaeological Museum, Hazarduari Palace, Murshidabad : canvas paintings
A, *before, and* B, *after treatment. See p. 186*



A



B

Archaeological Museum, Hazarduari Palace, Murshidabad : canvas paintings,
A, *before*, *and* B, *after treatment.* *See p. 186*